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Bulletin

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GASTRIC CANCER AS A SEQUEL TO GASTRIC ULCER*

WILLIAM FITCH CHENEY, M.D.

SAN FRANCISCO

This paper is presented to call attention to three propositions: I. Gastric cancer originates from gastric ulcer much more often than was formerly believed. II. We have no diagnostic methods to tell us positively when a chronic gastric ulcer has become malignant, until the change is far advanced. III. Surgical treatment should be recommended for gastric ulcer more frequently in the future and with less delay.

I. ORIGIN OF GASTRIC CANCER

The literature of this subject goes back to Cruveilhier,[1] who first segregated simple chronic ulcer of the stomach from chronic gastritis on the one hand and cancer on the other; and whose observations and descriptions were so complete that gastric ulcer is still referred to in French literature as "Cruveilhier's disease." Even at the early date at which he wrote, 1829 to 1835, he noted the coexistence, at times, of ulcer and cancer and the possible relation of one to the other. From time to time after that others recorded the same observation, and their contributions are referred to in most textbooks, systems of medicine and magazine articles of the present century, dealing with this subject. To review here all the literature from Cruveilhier's time to this, on the topic of gastric cancer as a sequel to gastric ulcer, would be impossible. Suffice it to say that it includes contributions from German, French, Russian, Polish, and Italian, as well as from English and American investigators; and that there is almost unanimous agreement that gastric cancer does originate as an ultimate sequel to chronic gastric ulcer. As regards the frequency with which this happens, however, there has always been disagreement among observers. Some have insisted that cancer rarely developed on an ulcer site, others that it was a common occurrence. But from statistics obtained from many sources, in different countries, as years went by, the conclusion was gradually reached that about six to ten cases of gastric cancer in every hundred originated from gastric ulcer; and this percentage, generally accepted by authorities and handed down from textbook to textbook lulled the profession into a sense of indifference, because it did not seem to offer any special menace.

During the past decade, however, as resections of the stomach grew more common and as the pathologist examined more carefully the tissues removed at operation, it became evident that the accepted percentage of frequency was too low. Surgeons were the first to emphasize this fact. In England, Robson,[2] as early as December, 1904, in his Bradshaw lecture, claimed that in 38 out of 64 cases of operatively demonstrated cancer of the stomach, that is in 59.3 per cent., gastric ulcer had preceded. Moynihan,[3] in 1906, reported that 16 out of 22 cases of gastric cancer, or 72.1 per cent., gave a previous history of gastric ulcer; and remarked: "the sequence of gastric ulcer and carcinoma, so far as clinical evidence can support it, seems to be definitely established in more than half the total number of cases that come to surgical treatment." In 1909, Moynihan,[4] basing his conclusion at that later date on 100 operations for gastric cancer, stated "of all patients operated upon by me for cancer of the stomach, approximately two in every three have had a history of previous gastric ulcer." In America, W. J. Mayo,[5] so far back as 1907, announced that in 54 per cent. of 69 resections for gastric cancer, the clinical histories and pathologic examinations made it certain that the cancer had its origin in ulcer. Rodman,[6] in 1908, felt convinced that he could say the same in at least 50 per cent. of his cases. In Germany, Payr,[7] writing in 1910, and reporting the results of his studies of specimens obtained by resection for chronic gastric ulcer, stated that 26 per cent. showed either beginning or moderately advanced cancer formation; though in the vast majority of these, macroscopic examination gave no evidence of malignancy. Küttner,[8] in 1910, reported that 43.4 per cent. of resected tissues which at operation were pronounced callous ulcer, on microscopic examination proved to be carcinoma, and concluded; "it is in many cases neither clinically, nor with abdomen opened, nor even in macroscopic preparations, possible to distinguish callous ulcer from carcinoma—only microscopic investigation decides."

It is most interesting to note how at the Mayo Clinic with increasing experience the percentage of cases of gastric cancer as a sequel to gastric ulcer gradually rose. Graham,[9] writing in 1906, said it had been possible to demonstrate in 1903 that 15 per cent. of gastric cancers had an ulcer base; in 1904, the percentage rose to 18; and in 1905 it reached 47 to 49 per cent. Writing again in 1908 Graham[10] was able to show that

* Read before the Section on Practice of Medicine at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

1. Cruveilhier: Anatomie pathologie du corps humain; Maladies de l'estomac, Paris, 1829-1835.
2. Robson, Mayo: Cancer and Its Treatment, London, 1905, p. 23.
3. Moynihan: Brit. Med. Jour., Feb. 17, 1906.
4. Moynihan: Brit. Med. Jour., April 3, 1909.
5. Mayo, W. J.: Ann. Surg., June, 1907.
6. Rodman: Tr. Am. Surg. Assn., 1908, xxvi, 189.
7. Payr: Deutsch. Arch. f. klin. Chir., 1910, xciii, 436.
8. Küttner: Deutsch. Arch. f. klin. Chir., 1910, xciii, 410.
9. Graham: Boston Med. and Surg. Jour., Aug. 23, 1906.
10. Graham: Boston Med. and Surg. Jour., Nov. 12, 1908.

62 per cent. of all the patients operated on for gastric cancer gave a precancerous or nonmalignant ulcer history.

The contribution, however, that particularly brought the profession to a realization that old percentages were too low, came from the pathologists of the Mayo Clinic, Wilson and MacCarty,[11] who announced in 1909 that from 153 cases of undoubted carcinoma of the stomach, 109 or 71 per cent. showed sufficient gross and microscopic evidence of previous ulcer to warrant labeling them "cancer developing on previous ulcer." In 1913, in a later statement of his findings, covering all material examined to Nov. 15, 1913, Wilson[12] reported on 530 cases of gastric tumor obtained at operation or necropsy. The ordinary chronic lesions of the stomach he classified pathologically in three groups: Group A, chronic ulcer; Group B, lesions in all respects like those in Group A, except for the additional presence of carcinomatous areas in the border; Group C, lesions carcinomatous throughout. Of the specimens showing cancer, about 60 per cent. were in Group B and about 40 per cent. in Group C. The latest paper by Wilson,[13] published in December, 1914, reports on 445 gastric carcinomas examined in the laboratories of the Mayo Clinic, 399 specimens resected by the surgeon and 46 removed at necropsy. His conclusions in this are even more advanced than in any previous communication, for he says:

> When one considers the clinical evidence in relation to a careful histologic study of a large series of operative cases of gastric cancer, he is led to the opinion that, in all probability, very few cases of gastric cancer exist which have not taken their origin at the site of a previous ulcerative lesion of the mucosa; in other words, the pathologic findings show that gastric ulcer first develops and cancer is implanted thereon.

MacCarty and Broders[14] also reviewed the Mayo clinic material and published their results earlier in the year 1914. Of 684 specimens resected from the stomach, 191 were simple chronic ulcers in which no histologic evidences of carcinoma were present, 472 showed the characteristics of simple ulcer, plus the presence of carcinoma; while in 21 specimens of ulcer the presence of cancer was doubtful. They conclude first, that single and multiple chronic gastric ulcers occur with all the characteristics of simple ulcers plus the presence of carcinomatous cells in their borders, minus the presence of similar cells in their bases; second, simple and multiple gastric ulcers occur which present the macroscopic characteristics of simple ulcer plus the presence of carcinoma in the borders and bases, with glandular involvement and metastases. They call attention to the possibility that any gastric ulcer may not only become but may actually be carcinomatous at the time the diagnosis is made. They insist that the differential diagnosis is to be reached only by the pathologist after removal of tissue, and not by the clinician or surgeon; and that there is no other method that positively answers the question, except exploratory laparotomy and microscopic examination of tissue. They conclude with the significant remark:

> Whenever the clinician feels positive of the clinical diagnosis of chronic gastric ulcer, he should consider that carcinoma can not be ruled out by our present methods of clinical investigation.

German pathologists, however, during the past decade have not been able to discover any such close relation between gastric ulcer and gastric cancer as that just described. Hauser,[15] writing in 1910, quotes A. Schmidt's remarks in the discussion on this subject at the Twentieth Congress for Internal Medicine, in 1902. Schmidt had suggested that in at least a part of these cases ulcer is really secondary to cancer. Hauser, while accepting this view, admits that it could not explain reported cases of long-standing chronic ulcer with ultimate cancerous degeneration; but believes that these after all are very rare and not well proved. Aschoff,[16] in the 1911 edition of his "Pathological Anatomy," asserts that the transition of simple ulcer into cancer is not so frequent as has been claimed; and that one must think rather of the secondary origin of ulcer on cancer, through closure of vessels by the growth. In a communication in 1912 to current medical literature, Aschoff[17] makes this remarkable statement in criticizing Küttner's report:

> The fact that a number of chronic stomach ulcers, which were designated by the surgeon as callous ulcers and which resembled the form of the usual stomach ulcer, were shown microscopically to be cancer, proves less that an ulcer secondarily becomes cancerous than that a cancer may change itself into a typical ulcer.

Gruber,[18] writing in 1913, likewise asserts that instead of carcinoma developing on the floor of an old peptic ulcer, the ulcer forms on the base of a carcinoma or close beside it, due to plugging of nutritive vessels and subsequent necrosis. He admits that cancer may sometimes develop on an ulcer base, but concludes that frequency of such an occurrence can not be possible.

It is significant that in none of these articles by German pathologists is any mention made either in context or bibliography of the article by Wilson and MacCarty published in 1909, nor do they give any record of any such series of cases as Wilson and MacCarty report. But for that matter there is no other series of similar importance in the literature of this or any other country, nor has their work ever been repeated on such an extensive scale.

The main protest against the position assumed by surgeons and pathologists of the Mayo Clinic has come after all from clinicians, elsewhere than at this clinic; who do not find cancer developing as a sequel of ulcer in anything like the proportion of cases claimed. This opposition has been voiced particularly by Friedenwald,[19] who in his clinical study of one thousand cases of cancer of the stomach found only 23 per cent. that gave a history of any previous digestive trouble, and only 7.3 per cent. in which this previous history could be interpreted to mean chronic gastric ulcer. The writers of recent textbooks on diseases of the stomach do not seem to be much impressed by the pathologic reports quoted. Lockwood[20] says that among 174 cases of gastric cancer he found only 7 per cent. that gave a history pointing to previous ulcer. Stockton[21] places the percentage between 5 and 15.

11. Wilson and MacCarty: Am. Jour. Med. Sc., December, 1909.
12. Wilson: Mayo Clinic Papers, 1913, p. 149.
13. Wilson and McDowell: Am. Jour. Med. Sc., December, 1914.
14. MacCarty, W. C., and Broders, A. C.: Chronic Gastric Ulcer and Its Relation to Gastric Carcinoma, Arch. Int. Med., February, 1914, p. 208.
15. Hauser: München med. Wchnschr., 1910, No. 23, p. 1213.
16. Aschoff: Pathologische Anatomie, 1911, p. 719.
17. Aschoff: Deutsch. med. Wchnschr., 1912, No. 11.
18. Gruber: Ztschr. f. Krebsforsch., 1913, xiii, p. 105.
19. Friedenwald: Am. Jour. Med. Sc., November, 1914.
20. Lockwood: Diseases of the Stomach, Philadelphia, Lea & Febiger, 1913, p. 224.
21. Stockton: Diseases of the Stomach, New York, D. Appleton & Co., 1914, p. 416.

Both Aaron[22] and Kemp[23] offer no statistics as to how often gastric cancer follows gastric ulcer. Boas[24] says, without giving figures, "Such a metamorphosis (ulcer to cancer) is not to be numbered among the frequent occurrences."

The reason for this wide divergence between pathologists and clinicians lies apparently in the point of view. One set of investigators base their opinion on microscopic evidence furnished by resected tissues; the other on clinical histories, clinical course and final outcome. But so far back as 1908 Graham[10] called attention to the fact that a long-standing precancerous ulcer history was not essential to the conclusion that cancer was a sequel of ulcer; and showed that three types of history preceded the development of cancer: first, the long series of repeated attacks, throughout years, clearly diagnostic of chronic ulcer; second, an initial attack, with symptoms more or less severe, then months or years of quiet, and finally the development of malignant symptoms; third, acute symptoms of malignancy, attacking the patient in the midst of apparently perfect health, because the early history had been overlooked by the physician or the patient thought it not worth mentioning.

Further evidence that clinical and pathologic findings are not so far apart after all, is furnished by Smithies.[25] Reviewing, in 1913, 566 cases of cancer of the stomach from the Mayo Clinic, the diagnosis proved by operation, he found that 60.5 per cent. of these had a clinical history and findings such as belong to the picture of chronic gastric ulcer, prior to the time that the case assumed the picture that we take to mean malignancy. Again in 1914, reviewing 500 cases of gastric ulcer, demonstrated by operation, Smithies[26] calls attention to the frequency with which ulcers become malignant and remarks "certainly it would seem that more cases of cancer develop from previous benign ulcer than has heretofore been generally recognized."

Finally Wilson,[12] in his later communication, in 1913, answers the objections made by clinicians to his former paper in 1908, with a review of the clinical histories of 566 consecutive cases proved to be gastric cancer at operation. When the clinical and pathologic diagnoses of cancer-on-ulcer were compared case by case, they were found to agree in more than 80 per cent. of the cases. The 20 per cent. margin of disagreement was explained first by cases diagnosed clinically other than gastric—as gallstones; second, cases diagnosed clinically as ulcer but showing pathologically early cancer; and third, cases diagnosed clinically cancer-on-ulcer but with cancer so far advanced that pathologic evidence of previous ulcer had been destroyed.

From all the foregoing it seems to be proved that gastric cancer originates from gastric ulcer much more frequently than was formerly believed. Not every ulcer becomes cancer, but every ulcer is potentially cancer. Just how frequently the change takes place is still unsettled; but that at least half the cases of cancer develop on an ulcer base, seems to be a conservative estimate.

22. Aaron: Diseases of the Stomach, Philadelphia, Lea & Febiger, 1911.
23. Kemp: Diseases of the Stomach and Intestines, Philadelphia, W. B. Saunders Company, 1910.
24. Boas: Diagnostik und Therapie der Magenkrankheiten, Ed. 6, 1911, p. 566.
25. Smithies, Frank: The Significance of Gastric Ulcer with Respect to Gastric Cancer, THE JOURNAL A. M. A., Nov. 15, 1913, p. 1793.
26. Smithies: Interstate Med. Jour., March, 1915.

II. TRANSITION OF ULCER TO CANCER

How then are we to know when the transformation has taken place from a chronic ulcer to cancer? Is there any way to distinguish those ulcers still benign from those becoming malignant? We are compelled to answer that this is impossible, until the cancerous change has gone so far that little hope remains for successful operation. In the early stages, there is no method of diagnosis that can make us certain. The clinical history of chronic ulcer, commonly accepted as characteristic, is one of periodicity of attacks, with remissions or intermissions for days, then recurrence constantly for weeks; chronicity of such attacks, throughout years; pain the most constant symptom, but with no constancy as to its exact site, type or radiation; particularly the time that this pain occurs after food and its relief by taking food or alkalies; the occurrence of vomiting in some cases, of the vomiting of blood in others. If cancer ultimately develops, the symptoms described usually merge gradually into those of the malignant invasion, the principal new evidences being loss of weight, increasing anemia and more constant pain, not relieved by food. These additions, however, may not be marked, even though cancerous change has occurred, or may appear even when it has not. In another group of cases the ulcer symptoms may have disappeared entirely for weeks or months; then if these recur anew, they are taken to mean no more than previous attacks, even though they really are due to beginning malignant growth. As regards the physical examination of the abdomen, it is usually negative in uncomplicated gastric ulcer. If a tumor becomes palpable, no one can be certain whether it is due to new growth of cancer or to cicatricial tissue of ulcer; unless it is so large and well defined that with certainty in diagnosis comes hopelessness in prognosis. Gastric analysis after test meals does not settle the question; for, contrary to old views, high percentages of free hydrochloric acid are not inconsistent with the presence of cancer, and low percentages are not diagnostic of its presence. Smithies[27] has recently given us most exhaustive information on this and other questions connected with gastric analysis, based on the examination of 7,041 gastric contents. Blood in gastric contents, either visible or occult, is too common after test-meal extraction to be of any great significance. As regards microscopic examination, for Boas-Oppler bacilli, yeasts, sarcinae, etc., Smithies[27] concludes: "There is no characteristic microscopic picture of early gastric cancer other than that associated with gastric ulcer of the retention type." Finally, as regards evidence obtained by roentgenoscopy, all authorities agree that it is inconclusive in the early stages, when certainty is most desired as to whether ulcer or cancer is the real lesion present. There can be no better testimony than that of Carman[28] on this subject, who says: "At present none of the Roentgen-ray signs of cancer or ulcer is pathognomonic; the relative value of these signs, singly or in groups, can be learned only by experience; nor should the diagnosis rest on them alone." After this survey of the situation, we arrive finally at the conclusion expressed by MacCarty and Broders:[14] "Whenever the clinician feels positive of a clinical diagnosis of chronic gastric ulcer, he should consider that carcinoma can not be ruled out by our present methods of clinical investigation."

27. Smithies: Am. Jour. Med. Sc., February, 1915.
28. Carman, R. D.: The Technic of Roentgen-Ray Examination of the Gastro-Intestinal Tract and the Interpretation of Screen and Plate Findings, THE JOURNAL A. M. A., Aug. 2, 1913, p. 321.

III. TREATMENT

In the light of these facts, where does our duty lie? Admitting the frequency with which cancer follows ulcer and the difficulty about determining when the change has taken place, how is this to influence treatment? It seems logical to conclude that surgery should be advised more frequently and more promptly hereafter than heretofore. Cases of chronic ulcer occur in two clinical groups; those with food retention and those without. When to the clinical picture of chronic ulcer as previously outlined are finally added the evidences of pyloric obstruction, furnished by repeated vomiting of retained food, the presence of food refuse in the fasting stomach, the occurrence of a peristaltic wave and the demonstration of bismuth residues by roentgenograms, there can be no further doubt about the proper course to pursue. Mechanical obstruction demands mechanical relief, no matter whether it is due to the cicatrix of ulcer or the new growth of cancer.

But treatment of the second group, without food retention, remains as debatable ground. The mere possibility of malignant degeneration need not prompt us to advise operation as soon as a diagnosis of gastric ulcer is made; for even if we accept the extreme view that cancer never originates except at the site of a previous ulcer, it does not follow that every ulcer becomes cancer. Many ulcers heal, with or without medical treatment, as scars found at necropsy prove. But if after systematic medical treatment a cure is not effected, or if relapse occurs and the symptoms take on the characteristic chronicity, then the possibility of ultimate malignant change must certainly be taken into account in deciding what course to pursue.

In advising surgery, however, what can we expect to accomplish by it? Three methods of operation are employed at present: resection of the ulcer, gastro-enterostomy and a combination of the two. Resection would seem the ideal plan, in order to avoid the possibility of malignant degeneration; but resection alone does not assure against the development of a new ulcer, which not infrequently occurs. Gastro-enterostomy affords primarily drainage of the stomach, thus prevents further irritation of an ulcer and so permits healing to take place; but it also permits regurgitation into the stomach of duodenal and jejunal contents and so brings about an entire change in the physiology of the organ. Although duodenal ulcer is more common than gastric, duodenal cancer is rare; and in explanation of this fact Wilson[12] expresses the opinion that in the duodenum there is some protective mechanism against malignancy. Statistics show that by gastro-enterostomy this duodenal immunity to cancer is in some way conferred on the stomach; for after gastro-enterostomy for chronic ulcer, without excision of the ulcer, cancer rarely develops. Many surgeons at present insist that the plan giving the greatest possible assurance of permanent cure is the combined operation of resection of the ulcer with gastro-enterostomy.

Questions of surgical technic must be settled by surgeons themselves. But it seems reasonable to conclude that surgical operation, in any case of chronic ulcer that persists after attempts at cure by any of the well-known medical plans, gives our patients a better chance for escape from ultimate malignancy than we can promise without operation; and that we ought to advise this resort sooner than has been the rule heretofore, without waiting for urgent symptoms that indicate pyloric obstruction or suggest cancerous degeneration.

Shreve Building.

ABSTRACT OF DISCUSSION

Dr. Frank Smithies, Chicago: We should thank Dr. Cheney for his open-minded summary of this vital subject. There has been great misunderstanding regarding the interpretation of ulcer and cancer statistics. There has been a confusion of viewpoint. Because we have shown that in a large group of surgically and pathologically demonstrated cancer cases there is an antecedent history in over 60 per cent., which, clinically, we are not able to differentiate from that of peptic ulcer, it has been assumed and stated that the reverse is true, namely, that some 60 per cent. of gastric ulcers terminate in cancer. These things are entirely different. Given a gastric ulcer, nobody can prognosticate the course of that ulcer. It is impossible to say whether it will heal without deformity, whether it will continue as a benign ulcer or whether it will eventually terminate as cancer. That is the crux of the entire situation. We do not know the life history of any gastric ulcer, acute or chronic. We have based our diagnosis too often on symptomatology. It has been shown ulcer symptomatology may be closely simulated (particularly in patients under the age of 30) by lesions not in the stomach at all. These lesions are commonly in the gall-bladder or appendix. They are commonly associated with pyloric spasm. The symptoms are so much like those of ulcer that this symptomatology has firmly established itself in the literature as that of gastric ulcer. Until gastric lesions have a certain time factor connected with them—a certain periodicity—or unless they have been associated with definite, gross, hemorrhage, and not necessarily hemorrhage revealed by chemical tests, we cannot say absolutely that we are dealing with gastric ulcer. We are told that the majority of cases of ulcer of the stomach occur in early life—from 25 to 35 years of age. That has not been proved. It has been shown at the operating table and at necropsy that proved gastric ulcers are present with greater frequency at a later period than 25 to 35 years. We must realize that we know nothing of the life history of gastric ulcer. In addition to symptomatology, our knowledge is based largely on the effects of treatment. Until perforation or severe hemorrhage occur, the course of gastric ulcer varies and often cures occur spontaneously. Equally good cures are reported by clinicians following many different types of therapy. We know that many cancers give previous history which it is impossible to separate from that of ulcer in a large majority of instances, and such history usually begins well after the age of 35. We do not know exactly when malignancy begins. It is important to bear this in mind when deciding when to advise operations. We internists have before us the responsibility of the problem of the prophylaxis of cancer of the stomach. When an ulcer is chronic in course, if the individual is approaching the cancer age and is having a continuous rather than an intermittent type of gastric disturbance, we should urge exploratory operation. The mortality from this is less than one-half of 1 per cent. In gastric cancer, unoperated, the mortality is 100 per cent.

Dr. Max Einhorn, New York: Dr. Cheney is favorable to the surgeons when he states that 60 per cent. of cancer is formed on ulcers. That does not tally with my experience. I must say that I do not make diagnosis of gastric ulcer on the symptoms of too much acidity and chronicity alone. Separating this group and speaking only of ulcer cases in which there are more cardinal symptoms, such as vomiting of blood, very severe pains with the finding of blood in the stools, there is only a small percentage that undergoes cancerous degeneration. If I should select only the cases in which I could make a diagnosis of cancer based on an ulcer, I would have a proportion of one in twenty or perhaps still less. For us clinicians this is of great importance, we must treat these cases according to our own experience. Many of the patients with hemorrhage get well and a large percentage of them remain well for years, possibly with a few relapses. In a few the improvement is not steady. But it would not be justifiable to treat all ulcers according to the method that would be applicable to the minority of cases. The pathologists have often confused these cases with those

in which cancer becomes necrosed and forms an ulcer on its base, which is of frequent occurrence. That was demonstrated a long time ago but no especial attention was paid to it. There is practically always more or less ulceration in cases of cancer, but that is an entirely different proposition from the development of cancer on a true ulcer of the stomach. The pathologists who first demonstrated cancer beginning on an ulcer of the stomach, state that it is to be found only very rarely, the proportion being about 1:20. Rosenheim, who was next to demonstrate cancer on an ulcer, found it only in 1:15-20 cases and I think most clinicians will agree with his findings. So that it is not necessary that we should treat ulcer of the stomach with the idea that all such ulcers will turn into cancer. The cases we would lose at operation would be greater in number than the cases we would lose otherwise later on from cancer. If the patient has ulcer of the stomach and does not do well under medical treatment, we may conclude it is a case for surgery. If the hemorrhages are so great that they endanger life we should operate, preferably during the interval. In cases in which pain persists under medical treatment, we should try surgery. The results of surgery are not altogether good in cases of persistent pain. We may occlude the pylorus, do a gastro-enterostomy and still the patient will have pain. But we should recommend surgery in persistent cases as affecting the most hope of relief.

DR. F. A. SPEIK, Los Angeles: If I heard correctly, Dr. Cheney made no division of the ulcers which should be treated surgically or those which cause mechanical obstruction. A recent article by Sippy in THE JOURNAL states that mechanical obstruction at the pylorus is due in some cases to pyloric spasm and inflammatory swelling, which disappears under energetic medical treatment, proper feeding and the use of alkalies. I too have taken cases with as much residue as a quart for eight hours, with sarcinae and high acidity. Under treatment they improve steadily. Possibly there may be some recurrences, but the majority do not recur. Although the narrowing may be quite complete, the opening seems to become wider and the food passes through. I had a recent case, a Jewish patient about 65 years of age, who had been to three surgeons. He had lost 17 pounds in weight, was vomiting old food with high acidity and could not retain sufficient food to nourish him. He was not satisfied to have an operation until he consulted three men. He then entered the California Hospital, but when they began to administer ether he jumped off the table, grabbed his clothes and dressed outside the hospital, so they could not catch him. He went to the county hospital, where I made a diagnosis of pyloric ulcer with inflammatory swelling. I then treated him. He has not vomited since, and has gained 50 pounds in weight. If he had been operated on he might have died. If he recovered it would have been a surgical cure. As you know, these gastro-enterostomies are not all done by the Mayos. The loss of life is almost as great from such operative procedures as it is from cancer of the stomach. What can we do to prevent this great loss of life and cancer of the stomach, and do away with the complications of ulcers that require surgery? We should recognize ulcer of the stomach early and treat it energetically. It is the early recognition of this disease that is most important. It is partly the fault of the layman, the press and the physician that these patients do not oftener receive early and proper medical treatment. The layman may think he has nervous dyspepsia or indigestion and not go to a physician. Or the advertisements in the press may induce the patient to take remedies that obtund the patient's sensibility and thus delay recognition of his true condition. If the patient does go early to the physician, he may not pay sufficient attention to the case, and prescribe without making an accurate diagnosis. We should educate the public to do away with so-called stomach cure advertisements and work harder to make an accurate diagnosis. Early, energetic medical treatment would reduce the cases requiring surgery and do away with the tremendous loss of life from cancer of the stomach. Heal the ulcer and prevent cancer!

DR. THOMAS MCCRAE, Philadelphia: Two points might be emphasized. Dr. Cheney has discussed one reason for the difference in view; another is the difference in material. The material that goes to a surgical clinic—and they are getting more and more cases without previous study—is very different from the cases that come to a medical clinic. The same difference is true regarding hyperacidity. Some surgeons often say that hyperacidity always means ulcer. Many have learned after operating, that hyperacidity may be present without ulcer. Another point is the criticism made by many surgeons regarding the past history of patients with neoplasm. They say to us, "You do not take a careful history; if you had taken your history carefully, you would find a history of ulcer in the past." I must protest against this. Such a claim certainly is not true in the cases reported by Dr. Cheney, nor in the series mentioned by Dr. Einhorn.

DR. WILLIAM FITCH CHENEY, San Francisco: As has been brought out, all ulcer is not ulcer. What is ulcer is to be taken up in the next paper. But the patients who recover medically are not always ulcer patients. However, it is perfectly justifiable to treat the patient awhile medically to see if he will get well. Not all cures are cures. How are we going to tell when a man is cured? I have practiced long enough to find that many cases I have considered cured were not cured. They often come back a number of years later worse than when you first saw them. All surgery is not surgery. If the medical man makes a diagnosis of gastric ulcer, I would not for a minute contend that he should at once refer the case to a surgeon. He should try by medical means to cure the patient, for patients repeatedly get well following medical treatment. But if the patient does not recover or has a relapse, then he should have a surgical operation. When it comes to the surgical operation, it is just as much the duty of the medical man to provide a competent surgeon as it is to provide any form of treatment. He must assume the responsibility of what he advises his patient to do, and he should select the best possible surgeon. I make an earnest plea that we do not let our gastric ulcer cases go so long hereafter before we send them to the surgeon.

BIRDSHOT REMOVED FROM THE VITREOUS THROUGH THE PUPIL*

KASPAR PISCHEL, M.D.
SAN FRANCISCO

A. G., boy, aged 12 years, was brought to my office Feb. 12, 1907 (Journal No. 314). Two days previously, while quail hunting, a birdshot No. 9, fired from his companion's gun, at a distance of about 50 yards, had entered his left eye. The sight was immediately gone. The local physician gave him 10 c.c. streptococcus serum.

Right eye: Sight 5/4, fundus normal.

Left eye: One mm. up inward from center of cornea a triangular gray flap, lens cataractous, swollen; iris shows a tear in pupillary margin corresponding to the corneal wound. Fundus not visible. Pupil dilates irregularly with several posterior synechias after atropin. The roentgenogram shows a shot to be in the vitreous downward inward from the center.

In consultation, the opinion was divided between the removal of the eyeball and preserving it.

I decided to remove the cataract with the idea that I might then be able to see and remove the shot.

I find in my case book the following notes:

March 8, 1907: Projection of light only reliable horizontally outward. April 13, 1907: Eye nearly pale. Patient was sent home to the country. April 26, 1907: Pupil in upper part

* Read before the Section on Ophthalmology at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

clear. With transilluminator; gray floating membranes seen in vitreous.

When the patient returned again, May 3, 1907, he gave the following history:

The day before while wrestling with a boy he fell on him and bumped his head against the other boy's. He immediately felt a sharp pain in the left eye, lasting several hours.

To my great astonishment the shot lay now in the lowest part of the anterior chamber, whence it was removed under a general anesthetic. Apparently the fall forward and the striking of the head had caused the shot to pass through the pupil into the anterior chamber. The eye quieted down rapidly.

May 8, 1907: Eye pale, upper part of the pupil clear, in lower part secondary cataract. With transilluminator: grayish folds in lower part of vitreous. Sees movement of hands.

April 7, 1915: Sees movement of hands. Field (with a white piece 3 cm.) small, only outward. The cornea shows up inward from center an irregular scar at the point of entrance of the shot. The pupil is slightly irregular, oval up outward, 4 by 6 mm., clear, surrounded by a ring of secondary cataract. The fundus cannot clearly be seen. Behind gray bands in the vitreous I can make out extensive whitish patches and probably folds of detached retina.

This accidental occurrence shows us a way for the therapy in such cases. I would suggest removing the cataract as soon as possible and then trying to bring the shot into the anterior chamber through the pupil by methodical stooping exercises and even judicious bumping of the forehead while lying flat on the stomach.

Butler Building.

ABSTRACT OF DISCUSSION

DR. JOHN A. DONOVAN, Butte, Mont.: The results in this case justify the practice of the immediate removal of the traumatic cataract when secondary symptoms are not marked. The next procedure, to await developments, taking time to study the case, not being sure of the proper course to pursue, was more than justified by the results. This case but emphasizes the absolute necessity of studying every case of eye injury singly. These injuries should suggest to us the necessity for some enterprising shotgun artist among us to supply us with a complete table on ballistics, especially as to penetration. You will notice No. 9 shot is unusually small, therefore, its penetration is but little compared with the average size of shot. Again, at 50 yards, the penetrating effect of this very small shot is much reduced. Its effect when dropping into the vitreous is proportionally lessened; so that in another case the size of shot, distance from gun, caliber and proportion of shot to powder will assist us in determining its effect. I just saw a patient treated by my associate, Dr. A. W. Morse, during my absence a year ago. A grain of No. 4 shot struck his eye from across a river, leaving a wound which separated the iris from its junction, the eye being filled with blood. The patient was put to bed to await developments. The Roentgen ray showed shot in the orbit, but unfortunately a defective outfit gave unsatisfactory results as to location. Some days later the patient rubbed the shot out from between his lids. At present the eye shows a red reflex between iris and sclera at the point of injury, a black line and an enlarged black spot just opposite this in the choroid; vision is good. Puzzle: Did the shot go through the eyeball and how did it come out? At first we thought not; now we believe it went through the eyeball and worked itself out. I have had several patients in whom shot was imbedded in the posterior orbital tissue and no harm has been done by leaving it. If in the eyeball and loose, I would attempt removal as early as possible. If imbedded in the posterior wall, I would watch developments.

DR. ADOLF BARKAN, San Francisco: The interesting case described by Dr. Pischel brings to mind cases of a similar nature, in which treatment was not always so successful. I should like to mention briefly one which came to me in an earlier period when this most valuable remedy for locating foreign bodies in the eye was not at our disposal. It was a case of a young boy in the country whose eye was injured by his cousin while quail hunting. We were in doubt as to the existence of a shot in the eye. About the fourth week after the injury, sympathetic irritation of a very severe nature appeared in the other eye. We removed the injured eye. When I shook the enucleated eye I then enjoyed the most pleasurable tactile sensation that I ever experienced in my life, for I felt the shot moving within. The other eye recovered. The method suggested by Dr. Pischel is one which most of us may have occasion to apply. I recollect several cases of cataracts luxated into the vitreous, which we successfully removed from the eye by systematically bending the patient's head down after enlarging the pupil, bringing forward the cataracts into the anterior chamber and then extracting them.

DR. EDWARD JACKSON, Denver: With a shot so small as this, the doctor should be congratulated on getting it readily out of the anterior chamber. I remember one case in which the shot entered the anterior chamber but did not penetrate the iris. When the anterior chamber was opened the shot disappeared and we thought it had passed into the posterior chamber through the iris. Then it reappeared under manipulation. We have not generally realized the difficulty thus encountered, and that the angle of the anterior chamber is to be seen only with the ophthalmoscope. This particular shot, which I think was about the size of the one Dr. Pischel passed around, disappeared absolutely when we attempted to extract it from the anterior chamber. But in changing the patient's position so that the eye was face downward, the shot again presented itself and we got hold of it and it was extracted. Bird shot may be made of cast iron, and in Europe such a shot has been extracted by the use of the magnet. That should be borne in mind; but so far as I know such shot in this country is all made of lead.

DR. A. E. EWING, St. Louis: Dr. Pischel is to be congratulated that he was able to obtain this shot at all. I have had a similar experience in the last two years, the case differing in that the shot passed into the eye from above through the sclera and the vitreous and returned to the lower position of the anterior chamber. Its removal was accomplished by keeping the head forward and by pressing the sclera against the lens in the ciliary region below, thus preventing its return to the vitreous, which was threatened several times.

DR. JOSEPH L. MCCOOL, Portland, Ore.: I recall a case very similar to the one reported by Dr. Pischel which presented some unusual features. A young man while chopping wood was struck in the eye by a small chip of steel, which passed through the cornea, iris and lens. With both the ophthalmoscope and oblique illumination what resembled the foreign body was located apparently in the substance of the lens. Repeated applications of the Parker magnet through a corneal incision failed to dislodge the steel into the anterior chamber. After making another examination I assumed that the chip of steel had passed through the entire thickness of the lens and dropped down into the vitreous. The magnet was again applied in such a way as to draw the steel through the zonule and up from behind the iris through the pupil into the anterior chamber. It was delivered through the artificial incision in the cornea made twenty-four hours before. The unusual feature in this case was the appearance of the lens; what looked like a small, thin piece of steel embedded in the substance of the lens was in reality the edges of the wound which, due to the difference in refraction from the center of the wound and the surrounding lens substance, gave the impression of a foreign body.

DR. KASPAR PISCHEL, San Francisco: I would like to add that several shots were taken out of the face and that we tried magnetization of the shots but unfortunately they were not attracted by the magnet.

STONE IN THE KIDNEY AND URETER

A CRITICAL REVIEW OF 157 CASES *

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BOSTON

This paper is based on a careful study of 157 cases occurring on the surgical service of the Massachusetts General Hospital during the seven years prior to Jan. 1, 1914.

AGE

The interest attaching to the age of these patients centers, not above their average age, but about the time at which stones causing symptoms are most likely to occur. It is therefore most interesting to study them by decades. The ages at the time of entrance were divided as follows:

First decade	1
Second decade	8
Third decade	56
Fourth decade	45
Fifth decade	27
Sixth decade	14
Seventh decade	2

It was further interesting to subtract from the age at entrance the time during which these patients had had symptoms obviously due to stone in the kidney, thereby obtaining a table which more nearly approximates the age at which the stone became troublesome. Again divided by decades, the result is as follows:

First decade	9
Second decade	28
Third decade	56
Fourth decade	36
Fifth decade	14
Sixth decade	9
Seventh decade	1

Morris,[1] in a similar inquiry as to the age of 188 patients coming to him with stone in the kidney, obtained the following results, which are strikingly similar to ours:

First decade	1
Second decade	30
Third decade	54
Fourth decade	59
Fifth decade	34
Sixth decade	17
Seventh decade	2

From these results it will appear that the greatest number of patients have come for operation between the ages of 20 and 40, and that between the ages of 20 and 50 there were 128 out of 153 cases in which the age is noted. If, on the other hand, we consider the time of the onset of symptoms we find that it occurs at a very much earlier period, that a large number of cases undoubtedly begin between 10 and 20, that the largest number is found between 20 and 30 and that between 10 and 40 there occurred 120 out of 153 cases, while after 40 the frequency of occurrence of stone of sufficient size to require operation fell off very rapidly.

SEX

In this series there were 108 men and 46 women, a ratio which does not agree with the figures of most other observers and is perhaps due to the rather small number of cases. It was interesting to consider the side most frequently involved. Thus in the men the right side was involved in 41 cases, the left side in 53 and both sides in 14. In the women the right side was involved in 20, the left side in 16 and both sides in 10. It thus appears that in this series of cases the right side is more frequently involved in women and the left side in men. The frequency of involvement of the right side in women has been commonly explained as due to the more frequent occurrence of mobility of the right kidney with accompanying renal retention, an explanation which I believe has merit.

SYMPTOMS

Pain which could be described as colicky occurred at some time in ninety-six cases, or about two-thirds of the total. It was the presenting symptom, however, in only fifty and in the remainder was an occasional or unimportant symptom and frequently elicited only on careful questioning. In the remaining cases the presenting symptom was as follows:

Dull pain referred to the region of the kidney	32
Pain in the right lower quadrant	12
Backache	8
Pain referred to the bladder	7
Hematuria	7
Vague abdominal pain	4
Pain in the sacro-iliac or lumbar region	3
Epigastric pain	2
Chills and fever	1
Vomiting	1

The direction in which the pain was referred was inquired into in forty-two cases and resulted as follows:

Pain referred along the course of the ureter	13
Referred to the glands	10
Referred to the back	9
Referred to the groin	3
Referred to testes	2
Referred to the thigh	3
Referred upward toward the chest	1
Referred to the opposite side	1

CONDITION OF THE URINE

Accurate examinations of the urine were carried out in 150 cases with the following results:

The urine was entirely and persistently normal in	22 or 14 + %
Albumin in varying amounts was present in	111 or 74 %
Blood, either microscopic or macroscopic, was present in	103 or 68 + %
Pus was present in	109 or 68 + %

Of the cases showing a persistently normal urine, fifteen were cases of stone in the ureter and seven were cases of stone in the kidney.

RESULTS OF ROENTGENOGRAMS

Reports of the roentgenograms were found in the records of 127 cases, of which 8, or 6 + per cent., were persistently negative. As I have had occasion to point out elsewhere, I believe that this showing is more favorable than will be found in a larger series of cases, and it is likely that of the cases in which no Roentgen-ray report is recorded a considerable number were in fact negative. I believe that the Roentgen ray as used at the present time in competent hands fails to detect stone in between 10 and 15 per cent. of the cases.

MORTALITY

In this series there were 140 operations with 5 deaths, or 3 + per cent., which were distributed as follows:

Nephrectomy	2 deaths
Pyelotomy	1 death
Ureterotomy	1 death
Nephrotomy	1 death

* Read before the Section on Genito-Urinary Diseases at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

1. Morris: Diseases of the Kidney and Ureter, 1901, ii, 58.

Postoperative hemorrhage of notable amount occurred in two cases, but did not prove fatal in either. The various operations done in these cases were as follows:

Nephrectomy	20
Pyelotomy	47
Ureterotomy	36
Nephrotomy	37

At the present time pyelotomy is the operation of election with us and is done in all cases in which the stone can be extracted through the pelvis. Many of the cases of nephrotomy in this list belong to an earlier period.

On the question of comparative mortality it is interesting to note the results of others. Watson and Cunningham[2] collected from various sources 309 cases of nephrolithotomy, with 29 deaths, or 9.3 per cent., and 136 cases of nephrectomy, with 41 deaths, or 30.1 per cent.

Schmieden, quoted by Thomson Walker,[3] had 54 cases of pyelolithotomy with 6 deaths, or 11.1 per cent. He also notes that in this series 36, or 66.7 per cent., healed kindly, while 12, or 22.2 per cent., had persistent urinary fistulas. In our series there were no urinary fistulas, and we think that with modern technic this may be disregarded as a complication.

PREVIOUS UNNECESSARY OPERATIONS

One of the most striking facts brought out by this investigation was that a considerable number of these patients had been subject to previous operations without relief for symptoms afterward proved to be due to stone in the kidney or ureter. Twenty-six patients had had such operations distributed as follows:

Appendectomy without relief of symptoms	10
Exploratory laparotomy	7
Fixation of the kidney	4
Operation for gallstones	1
Adhesions not found to exist	1
Decapsulation of the kidney	1
Salpingo-oophorectomy	1
Suprapubic cystotomy	1

RESULTS

Though I have previously reported[4] the study of the results obtained in these cases, it may be proper to repeat the outstanding facts here. Eighty-five patients were examined by us at the clinic more than two years after operation, this examination including a general physical examination, examination of the urine and Roentgen ray. Patients were classified as well who showed a normal urine and a negative Roentgen ray. Patients were classified as not well when the urine showed pus, blood or albumin and the Roentgen ray showed a shadow, probably a stone. The result of this examination was as follows:

Of 64 patients operated on for stone in the kidney, 33, or 51 per cent., were well and 31, or 49 per cent., were not well. Of 21 patients operated on for stone in the ureter, 15, or 71 per cent., were well, and 6, or 28 per cent., were not well.

From this investigation the outstanding facts seem to me to be the following:

Stone in the kidney too large to pass occurs most commonly between the ages of 10 and 40, and with us has come to operation most commonly between the ages of 20 and 50, an observation which carries with it the conclusion that the diagnosis of stone in the ureter is not made with great promptness.

Renal colic is absent in a considerable proportion of the cases, and the pain caused by renal calculus may closely simulate that caused by various other abdominal lesions and is frequently mistaken for such lesions.

The urine is persistently normal in a proportion of cases sufficiently large to make it an uncertain guide.

The Roentgen ray is persistently negative in enough cases to make it dangerous to depend wholly on this evidence, but the combination of unusual pain symptoms, a negative Roentgen ray and a persistently normal urine is fortunately rare.

As I have had occasion to point out in an article published three years ago, the number of cases in which unnecessary abdominal operations are done through failure to detect a stone is far too large to be a credit to the medical profession.

87 Marlboro Street.

2. Watson and Cunningham: Genito-Urinary Diseases, 1908, ii, 191 (nephrolithotomy); 193 (nephrectomy).
3. Walker, Thomson: Genito-Urinary Surgery, 1914, p. 273.
4. Cabot: Tr. Am. Assn. Genito-Urin. Surg., 1915.

STONES IN THE URETER*

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Of the 654 cases of lithiasis of renal origin operated on at the Mayo Clinic up to June 1, 1915, 363 stones were removed from the kidney and 230 were found lodged in some portion of the ureter. To this number should be added sixty-four cases in which a stone lodged in the ureter was either removed at the time of the cystoscopic manipulation or was passed immediately after, making a total of 294 cases of stone in the ureter for consideration. It is our purpose to review a few of the various clinical data involving their diagnosis.

Localization of Pain.—Pain as a result of stone in the ureter occurs from two conditions: namely, (1) because of intrarenal tension as a result of urinary obstruction, and (2) because of localized infectious changes.

A review of the localization of pain in our series of cases is of interest. Pain was referred largely to the renal area in 197 (67 per cent.) of the cases; to the upper abdominal quadrant in forty-five (15 per cent.) of the cases; to the region of the lower ureter in twenty-eight (9 per cent.) of the cases; and to the suprapubic area in three cases. No definite radiation of pain was reported in sixteen cases and no pain whatever in five cases. It is obvious, therefore, that either an exploratory incision over the renal area or a roentgenogram of the renal area alone would fail to disclose the actual lesion. It is probably true that renal colic as a result of lithiasis is caused more frequently by stone lodged in the ureter than in the kidney. In a large number of cases in which the pain was referred to the upper abdominal quadrant it is easy to see how confusion with lesions in the upper abdomen might follow. In fact, in a number of cases, the radiation of pain was so typical of disease in the gallbladder that in the absence of uri-

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nary findings surgical exploration of the gall-bladder would have been justifiable without a preliminary roentgenographic examination. Of particular interest is the localization of the pain referred to the area of the lower ureter. It is probable that this group of cases is most frequently confused with appendicitis, particularly when the pain is on the right side. The localization may be so suggestive of appendicitis that, in case the urinalysis was negative, an exploration of the appendix might be justifiable without preliminary roentgenographic examination. The localization of pain to the region of the lower abdominal quadrant occurs usually as a result of ulcerative changes in the ureteral wall and subsequent periureteritis. A history, therefore, of previous colic referred to the renal area with subsequent pain localized to the lower ureteral quadrant would be suggestive of an impacted ureteral stone with periureteritis. This would be particularly true if the pain, previously periodic, became continuous over a period of a week or more. It should be noted that there was a considerable number of patients who did not complain of definite radiation and a few who did not have attacks of severe pain. These patients came to operation either because of a consequent renal infection, urinary symptoms or indefinite abdominal symptoms. It is undoubtedly true that stone in the ureter may exist for a long time, even a year or more, without being the cause of pain. Mechanical irritation caused by the stone itself will seldom produce pain. Occasionally, however, a history is obtained in which the patient claims to have been able to feel the stone in its passage from the kidney to the bladder, which in all probability is the result of a lesion in the mucosa subsequent to the passage of the stone. Eight patients gave a history of radiation of general abdominal pain, without localization, and with symptoms of vomiting and intestinal spasm suggestive of intestinal obstruction. Of this number three had previously been operated on elsewhere for intestinal obstruction. This peculiar radiation of pain, together with secondary intestinal symptoms, is evidently due to reflex action of the sympathetic intestinal nervous system. In twelve cases the degree of pain was secondary in importance to symptoms of gastric disturbance. The patients complained more of general nausea, epigastric distress and indigestion than of the pain referred to the urinary tract. Such reflex disturbances are in keeping with the secondary symptoms observed with lesions in other extragastric conditions.

Occurrence of Vesical Irritability.—Vesical irritability was reported in 218 patients (74 per cent.). This condition occurs so frequently that its absence is of distinct value in differential diagnosis. Although it more often occurs only at the time of the pain, it may continue for a day or two following. Occasionally it may be persistent over longer periods and may be the predominant symptom. This is particularly true when the stone is lodged in the vesical portion of the ureter. When the stone bulges into the meatus it may in fact be considered a vesical stone so far as its effect on the bladder is concerned.

The Value of Urinalysis.—The practical value of the presence of a few red blood cells or pus cells in the urine in the diagnosis of ureteral stone has been exaggerated. Similar microscopic elements are found so frequently in the urinary sediment with slight lesions in the lower urinary tract that its diagnostic value is greatly lessened. The presence of a few red blood cells or pus cells in the urine, however, necessitates a careful roentgenographic examination of the urinary tract even though the subjective symptoms are of negative value. On the other hand, the absence of pus or red blood cells would not exclude the possibility of stone in the ureter. Whereas catheterization of the ureter may localize the origin of the pus cells, because of the possibility of traumatic hemorrhage it is of no value in localizing a few red blood cells. Neither pus nor red blood cells were found in thirty-five (12 per cent.) of the cases. An occasional red blood cell only was found in twenty-six (9 per cent.) of the cases. An occasional pus cell only was found in seven cases. Both red blood cells and pus cells to a varying degree were present in the remaining cases.

Gross hematuria was reported in forty-one (14 per cent.) cases of stone in the ureter, while with renal stone it was found in 56 per cent. of a series of cases of renal lithiasis previously reported.[1] It should therefore be regarded as a symptom of less importance with ureteral stone than with renal stone. Persistent bleeding with stone in the ureter occurred in seven cases and was the result of ulceration in the ureteral wall. In one case the stone had caused necrosis of adjacent blood vessels with considerable resultant hemorrhage.

Palpation of the Stone.—Stone in the ureter is rarely palpable through the abdominal wall. We have observed one case, however, in which the stone could be rolled under the hand on deep pressure in the inguinal area. The stone on removal was 4 inches long and 1 inch in diameter. Our attention has recently been called to the value of palpation through the vagina or rectum in the case of stones lodged in the lower end of the ureter. Israel[2] claimed that he was able to feel the stone per vaginam and rectum in 39 per cent. of his cases. In the last eighty cases of stone in the lower ureter in which a special effort was made to feel the stone through the vagina or rectum, it was definitely palpated in only nine cases. Of these eighty cases forty-eight occurred in the male and in only three cases could the stone be definitely felt through the rectum. This leads us to conclude that rectal palpation is only exceptionally of definite value in localizing stone. The various conditions simulating stone which may cause localized nodular change in the prostate, seminal vesicles and ducts lessen the value of rectal palpation. In the thirty-two female patients the stone could be felt per vaginam in seven (22 per cent.) cases. In a few other cases an area of thickening could be felt in the vault of the vagina but was not definite enough to be of practical value. In order to be definitely felt per vaginam the stone should be at least a centimeter in diameter and should be situated within or immediately adjacent to the wall of the bladder. Unless so situated, stones of even several centimeters in diameter will not permit of palpation. It should be remembered that nodular changes in the lower ureter as the result of tuberculosis may occasionally simulate a stone. The fact that localized inflammatory areas of thickening may occur in the vaginal mucosa may also confuse the findings.

Treatment.—In the consideration of ureteral stone its renal origin should be borne in mind. In forty-one patients a definite history was ascertained of one or more stones having been passed previous to the exami-

1. Braasch, William F.: Clinical Data on Renal Lithiasis, Journal-Lancet, 1913, xxxiii, 561.
2. Israel, James: Ueber Operationen wegen Uretersteinen, Folia Urol., 1913, vii, 1.

nation, and in twenty-one varying amounts of sand or fine gravel had been passed. Some of these gave a history of colic at intervals during a period of more than a year before passing the stone. The majority, however, passed the stone with the first attack of pain or with the second or third attack. In all probability the majority of stones in the ureter pass spontaneously, and for this reason surgical interference is seldom indicated with the first attack of pain. While no rule can be adopted, it would be rational, in the majority of cases, to wait at least two or three months until Nature has made several attempts to dislodge the stone. On the other hand, repeated violent colic, the danger of renal destruction and other complications as the result of an obstructing stone may necessitate its removal before this period has elapsed. Before an abdominal operation is attempted, the passage of the stone may be aided by the various methods offered by endoscopic technic, namely, (1) catheter manipulation, (2) injection of sterile glycerin or oil, (3) fulguration, (4) ureteral dilatation, (5) cutting of the meatus, and (6) ureteral forceps. By means of these various methods we have been able to remove stone lodged in the ureter in sixty-four cases.

It has been claimed that the injection of oil and glycerin into the ureter would both increase the peristalsis and lubricate the walls of the ureter so that the stone would slide out. This theory, however, is not borne out by extensive observation. It is difficult to conceive how the natural efforts of peristalsis or how the natural lubrication in the ureteral mucosa could be improved on.

Forcible dilation of the ureter below the stone by means of ureteral dilators may be of value, particularly if the position of the stone is altered in so doing. Not infrequently it is possible to grasp a small stone situated in the wall of the bladder by means of the ureteral forceps. Those well above the wall of the bladder, however, can be removed in this manner in exceptional cases only. Slitting the meatus and adjacent ureter may occasionally be indicated with intramural stone. That no harm should follow the destruction of the ureterovesical valve has been demonstrated experimentally.[3]

It is our impression, however, that many of the stones lodged in the ureter which can be removed by means of these various methods will be passed spontaneously after dislodgment by means of the ureteral catheter. The stone becomes lodged in the ureter and subsequent colics may make its anchorage in the mucosa firmer. The passage of the ureteral catheter dislodges the stone, changes its axis, and the next colic forces it out. If this method should fail, an attempt should be made to thoroughly dilate the ureter below and, if possible, to grasp the stone with ureteral forceps. The use of the high-frequency current may occasionally be of value in disintegrating a small, frail stone. It should not be forgotten, however, that change in the position of the stone as the result of such manipulation is fully as effective as that caused by ureteral catheterization.

Sources of Error in Diagnosis.—A greater percentage of error in the roentgenographic diagnosis of stone in the ureter will result from incorrect interpretation of a shadow than from failure to show it. Although there are a number of generally recognized data in regard to form, size and density of the shadow which are regarded as characteristic of stone and of extra-ureteral bodies, respectively, such data cannot always be relied on. In fact, it is doubtful if an accurate diagnosis of stone in the ureter can be made from roentgenographic data alone in more than 60 per cent. of cases. The greatest percentage of error will probably occur in regarding extra-ureteral shadows such as phleboliths, glands, etc., as explanatory of abdominal pain with subsequent negative exploration. Next in frequency will be the interpretation of stone shadows as caused by extra-ureteral conditions, and last in the list of diagnostic errors charged to roentgenography will be the stones that fail to cause a shadow in the roentgenogram. In our series the roentgenographic report was negative in thirty-two (11 per cent.) of the cases. The various causes to which the failure was ascribed are in the order of frequency as follows: (1) error in roentgenographic technic, (2) position of the stone, (3) size of the stone, and (4) the character of the stone.

1. Many various possible sources of error in roentgenographic technic make it practically impossible to make an ideal roentgenogram in every case in the course of routine roentgenography. There will always remain a few cases in which if the preparation of the patient, the condition of the tube, and the condition and development of the plate had all been better, the stone shadow, which was otherwise missed, might have shown.

2. It occasionally happens that the shadow of the pelvic bones obscures that of an overlying stone. Such error may be obviated by adjusting the angle of the ray so as to exclude the shadow of the pelvic bones. It is not always possible to do so, however, and in the course of routine roentgenography there will always remain an occasional stone which is overlooked because of the pelvic bone shadow.

3. The degree of obstruction is not dependent on the size of the stone. Not infrequently a very small stone, even as small as a pin head, lodges in the ureter and causes inflammatory reaction in the adjacent ureteral mucosa with stricture so as to cause marked periodic urinary obstruction. Such a stone shadow will frequently be either misinterpreted or entirely overlooked in the roentgenogram.

4. Least in frequency among the causes of roentgenographic failure should be considered the character of the stone. Whether or not a stone is demonstrated depends largely on the calcium content. Although a stone composed of uric acid or phosphatic elements may not cast a distinct shadow, nevertheless the great majority of stones are composed of a mixture of calcium with the various other salts and the absence of a shadow is usually to be explained by the previously mentioned reasons.

Localization of Stones.—A review of the 230 cases with operation for stone in the ureter demonstrates the occurrence and position of the stone as follows:

Ureteropelvic juncture	26 cases
Upper third	28 cases
Middle third	1 case
Lower third	159 cases

The last group was subdivided as follows:

Iliac crossing	4 cases
Pelvic portion	90 cases
Ureterovesical juncture	41 cases
Intramural	22 cases
Meatus	2 cases
Not definitely located	3 cases

3. Draper, John William, and Braasch, William F.: The Function of the Ureterovesical Valve, THE JOURNAL A. M. A., Jan. 4, 1913, p. 20.

It will be seen that 159 (74 per cent.) of the 214 cases localized were found in the lower third of the ureter and that the greatest number were found in the so-called pelvic portion of the ureter, which term includes that portion of the ureter extending from the point of narrowing at the iliac crossing to the ureterovesical juncture. The majority of the stones in the pelvic portion were not lodged exactly at the point of narrowing at the ureterovesical juncture but a short distance above it. The same is true of the stones described at the ureteropelvic juncture, the majority of which were found a short distance above the point of narrowing. The stone was impacted within the wall of the bladder itself in twenty cases, a proportion of operative cases which will no doubt be reduced in the future as the result of the recent improvement in operative cystoscopy. The small number noted which were lodged at the meatus was due to the fact that although a number of others were so situated, they were all removed by means of endoscopic technic. The small number found at the point of iliac crossing and in the middle third is surprising. It is difficult to explain the large number of stones found in the upper third of the ureter. They were found well below the point of narrowing and at the ureteropelvic juncture, and their presence on exploration offered no explanation for this unusual condition. The majority of such stones, however, were of considerable size. The average size found in the lower third of the ureter was much smaller than those found in the upper ureter. As a general rule, stones situated in the ureter at points other than those of natural narrowing were larger and caused more renal destruction than the others. This series does not include a number of stones which were demonstrated at the preliminary roentgenographic examination to be situated in the ureter, but which at operation or subsequent to ureteral catheterization were displaced into the pelvis of the kidney when they were removed.

Occurrence of Stone.—In regard to the occurrence of stone: in 134 cases it was found in the left ureter and in 144 cases in the right—practically no difference as to the side. Single stones were found in 261 and multiple stones in seventeen cases (93 per cent.). Stone occurred in both ureters in six cases; in the kidney on one side and in the ureter on the other in eleven cases; or a total bilateral occurrence of seventeen (6 per cent). It is evident that bilateral occurrence of stone in the ureter which comes to operation is much less than that in the kidney. This discrepancy may be at least partially explained by the frequent spontaneous passage of ureteral stones. Stone occurred in the kidney as well as the ureter on the same side in twelve cases (4 per cent.).

It will be noted that the stone in the ureter was not found on exploration in thirteen cases. In three of these cases the stone was pushed into the bladder during operation and passed afterward. In three other cases the stone was found to have been passed during the few days intervening between the clinical examination and the time of operation. In four cases the stone was passed after the operation. In five cases no stone was found at operation and there was no subsequent history of a stone having been passed, which can be explained only by error in the diagnosis. It is obvious, therefore, that should there be an interval between the last clinical examination and the operation, another secondary roentgenoscopy should be made just prior to the operation since the stone may either have passed during this interval or it may have greatly changed its position. Particularly is this true if a cystoscopic examination with ureteral catheterization has been made. The patient should be questioned whether or not severe pain has been experienced following examination. It should also be remembered that in spite of the absence of colic, the position of the stone may have greatly altered.

PLASTIC SURGERY OF THE KIDNEY PELVIS AND THE URETERS*

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Conservative plastic surgery of the kidney pelvis and the ureters has scarcely received the attention it merits when we consider that Kroiss,[1] in 1908, in a very comprehensive paper on the subject, was able to collect reports of only 102 cases, and Weinberg,[2] in 1911, added reports of but forty-nine operations to the literature on the subject in his exhaustive article. The limited scope of the present study does not permit more than a hasty review of the seventy or more cases I have been able to gather since June, 1911, exclusive of my own unreported cases.

Weinberg's paper includes several personal observations, notably three ureteropyeloneostomies from his Heidelberg clinic. A subsequent cystoscopy in two of the cases showed that the ureter was definitely obliterated in one case and probably so in the other. Strange to say, the latter patient experienced no discomfort whatever from the condition, so that this case may be considered a cure. Weinberg also claims five Fenger extrapelvic operations to his credit; these, together with seventeen previously reported cases, comprise nineteen cures. He also publishes reports of six new cases of ureteropyeloplasty (Fenger) in literature, making altogether twenty-six cures, four failures, two deaths, and one case of persistent postoperative fistula.

Eliot[3] collected 111 reports of cases of conservative plastic operations on the kidney pelvis and the upper urinary tract, seventy-four for hydronephrosis and thirty-seven for pyonephrosis, comprising fifty-seven clinical cures, and seventeen cures by chromocystoscopy, ureteral catheterization, etc.

Although the function of a hydronephrotic kidney is impaired, the organ is not useless, and it does not regain its normal function after the obstruction has been removed. Walker[4] experienced this in a case in which he resected a portion of the kidney pelvis on one side, and performed a similar operation on the other side in a few weeks. After the second intervention the patient began to lose flesh rapidly and showed gradually increasing symptoms of renal failure, death ensuing six weeks afterwards.

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* On account of lack of space this paper has been abbreviated for THE JOURNAL. It will appear in full in the Transactions of the Section and in the author's reprints.

1. Kroiss: Beitr. z. klin. Chir., 1908, lviii, 423.
2. Weinberg: Beitr. z. klin. Chir., 1911, lxxii, 779.
3. Eliot: Jour. d'urol., 1913, iii, 161.
4. Walker: Proc. Roy. Soc. Med. (Surg. Sec.), 1913, vii, 59.

Resection of the hydronephrotic portion of diseased kidney pelves is reported by Rumpel[5] in two cases, both of which presented double kidney pelves and reduplicated ureters. The operation in the one case was done by making an incision into the firm part of the parenchyma and leading downward to the internal substance so that the renal pelvis, previously exposed, was not separated from the resected portion. After the corresponding ureter had been properly ligated, it was cut and the wound closed with drainage tubes inserted. In the second case, after the ureter of the hydronephrotic portion was exposed and ligated, the hilum was exposed. A coarse catgut thread was wound around the entire circumference of the kidney at the junction of the normal and the diseased parts. A second thread, leading from this same point downward, was passed around the diseased portion. After the latter was secured, the stem was separated by two Péan clamps. The median portion of the kidney was then cut below the upper thread. The hydronephrotic part now connected only with the corresponding ureter, and cutting the latter completed the operation. In addition to circular suture of the delicate ureter, the central end of the one corresponding to the normal half of the kidney was invaginated into the periphery of the dilated ureter, its passage into the bladder having been tested by means of a catheter. A urinary fistula persisted for a period of six weeks but finally closed.

Grégoire[6] reports a successful ureteropyelotomy for intermittent retention which was found to be due to a stout artery, which, coming from the renal body and leading down to the lower pole, passed in front of the ureter. The latter, as it emerged from the pelvis below the line followed by the artery, was forced up and had wound itself around the artery in order to find its way posteriorly into the pelvis. The orifice of the ureter was not contracted, but there was considerable dilatation below the point where the artery passed the ureter. At operation the ureter was ligated at its opening into the pelvis and cut below this point; the upper stump was then cauterized. A longitudinal opening was then made at the lower part of the pelvis and sutured at this point to the extreme upper part of the ureter. A second tier of sutures covered the first, and involved the superficial layers of the ureters and the kidney pelvis. The wound was closed with drainage.

Gayet[7] did the rather unusual operation of orthopedic resection of the renal pelvis (only seventeen similar ones are reported in literature) in a case of intermittent acute renal colic persisting for eight years. The patient recovered completely in about three months.

In the matter of treating the wound in the kidney pelvis and the ureters after removal of stones, that is, between suturing or drainage, Pierre Bazy and his son, Louis,[8] obtained the better results with sutures. In eleven out of eighteen cases in which it was done they had nine uneventful recoveries. Although the other five patients did well, the flow of the urine through the wound persisted for some time. They advocate suturing whenever the prolonged operation presents no added risk for the patient; they find it especially indicated when the incision is a long one.

Darrach,[9] in a case of stone which was located at the pelvic brim, made an incision from the tip of the twelfth rib downward and forward toward the anterior spine. Both the kidney and the ureter were enlarged and distended. The kidney capsule could not be delivered into the wound on account of its short pedicle. The ureter was freed and the stone felt at the pelvic brim. It was milked upward until it could be reached through the wound and removed through a half-inch longitudinal incision. The upper route was chosen in this case on account of the necessity of inspecting the kidney itself. The kidney was spared because it was hydronephrotic and also because of functional impairment of the other kidney.

Brentano[10] used the vaginal incision for removal of stone from the ureter with the unpleasant result of return of renal colic nine days afterward. This was found to be due to a stone left in the bladder. A ureterovaginal fistula had developed owing to the penetration of the stone through the sutured ureter. Two more operations were required to close the fistula. The patient recovered.

In a case reported by Michailov, the proximal end of a dilated ureter protruded into the renal pelvis and prevented the flow of urine. The kidney was soft and atrophied. The protrusion of the ureter was removed and its roots tied with catgut. The edges of the wound in the kidney pelvis were sutured to the skin with silk. A few days after the operation the kidney was washed several times with collargol. A plastic operation was done two weeks later to close the fistula. The patient was reported well two months subsequently.

Payr[11] suggests a pedunculated flap of the capsula fibrosa for securing the pyelotomy incision. He makes the flap about two finger breadths in width, with the stem toward the hilum and turned at an angle of 180 degrees, laying it on the kidney pelvis at the beginning of the ureter, surrounding the latter like a cornucopia. The flap thus formed is attached to the kidney pelvis with a number of fine catgut sutures, and accommodates itself without tension to its new position.

An original technic for circular ureterorrhaphy is described by Proust and Buquet.[12] They first prepare the mucosa of the upper end of the ureter and evert it, then do the same to the lower end. After dilating the upper portion of the lower stump by separating the blades of a fine forceps introduced into the lumen, the ureter is divided longitudinally between two artery forceps for about 1 cm. Invagination is the next step in the operation, and inversion of the lower end the last one. These authors believe that coalition is better by this disposition of the surfaces than that obtained by the action of sutures, for, no matter how soon the catgut is absorbed, the two ends will not separate.

The technic of ureterorrhaphy for total section of the ureters is also discussed by Sejournet.[13] He cites numerous old and also recent cases in which one or the other method of suturing was used for ureters accidentally or purposely cut (principally during gynecologic operations). His observations lead him to conclude that cicatrization of end-to-end sutures of the ureter is the simpler method, producing more perfect coaptation of the two fragments. Suture by invagination causes absorption of the invaginated

5. Rumpel: Ztschr. f. urol. Chir., 1914, ii, 33.
6. Grégoire: Jour. d'urol., 1912, i, 83.
7. Gayet: Jour. d'urol., 1912, i, 625.
8. Bazy, P., and Bazy, L.: Jour. d'urol., 1912, ii, 645.
9. Darrach: Ann. Surg., 1913, lvii, 761.
10. Brentano: Deutsch. med. Wchnschr., 1911, xxxvii, 666.
11. Payr: Centralbl. f. Chir., 1912, xxxix, 1505.
12. Proust and Buquet: Jour. de chir., 1913, x, 417.
13. Sejournet: Rev. de gynec. et de chir. abd., 1914, xxii, 199, 287.

portion, which undergoes a sort of reptation (crawling) and the two stumps finally meet end to end. This secondary cicatrization forms favorable conditions for future stenosis.

An accidental severing of a ureter during an operation led Forssell[14] to devise the following method of repair. Making a slit into the wall of the vesical ureteral stump, he removed the mucous membrane for a distance of about 0.5 cm. He then invaginated the renal end into the vesical one by means of a mattress suture, which included the walls of both stumps a few millimeters from the membrane-free periphery, just opposite the slit, and was tied to the outer surface of the lower stump. The slit in the latter was then closed with interrupted catgut sutures, and its transverse incised surface united with the outer layer of the stump.

McKechnie[15] advocates the abdominal route and the inverted position in operations on the ureters. He believes that if "modern technic can master the problems presented by operations on the bile tract, the bowels and the tubes, it can surely be made to answer for the ureters, and a formidable and difficult operation rendered safe and easy." He reports two successful cases in which he repaired the ureter injured during an ovariotomy in one case, and supravesical hysterectomy in the other. With the patient in the Trendelenburg position, the operation was done through the abdominal wound and the ends of both ureters implanted, divided above the points of leakage, into the bladder, the remaining distal portions being left to "look after themselves."

Much divergence of opinion exists as to the treatment of ureteral fistulas. The intraperitoneal implantation of the proximal end of the ureter into the bladder seems to be the procedure of choice in fresh lesions not too remote from the bladder and for fistulas when the corresponding kidney and the bladder are normal. Suturing the ureter does well for small lesions, but it is not in favor, as we have seen, for extensive lesions, since a sutured ureter always shows a tendency to produce stenosis. While nephrectomy has really never disappeared from the operative repertory for ureteral fistulas, the opinion today appears to be that it is best not to interfere with the kidney so long as it does no harm, in other words, so long as the urinary tract is healthy. Implantation into the abdominal wall, as we all know only too well, produces uretero-abdominal fistulas, but the danger of ascending infection into the kidney is one of its greatest disadvantages. While some authors have reported brilliant results with simple ligation of the proximal end of the ureter, experimental studies have shown that the ligatures develop a pronounced tendency to fistulous formation by the wearing away of the ureteral wall. Frankenstein,[16] for example, considers simple tying off of the ureter equivalent to removal of the kidney as far as the beneficial effects on the patient are concerned. While doing a supravaginal hysterectomy for tumor he found that the neoplasm extended subperitoneally into the entire vascular cavity. A part of the ureter ran along the linea innominata through thick, friable, caseous tumor masses, and precluded free dissection of the ureters. He therefore ligated the central portion of the ureter and resected it. After removing the tumor and the uterus, he again ligated the central portion of the ureter and dropped it into the subperitoneal cavity. The laparotomy wound was closed with drainage. In spite of the happy outcome of this case, Frankenstein would not again content himself with simple ligation, as he is well aware of the dangers to which I have just referred. With this risk in mind, Stoeckel,[17] in two cases of advanced carcinoma of the ovary, modified his operation by treating the ureter as follows: After a ligature was placed at about 7 cm. above the free end, the latter was turned back on itself and again ligated at the same point, producing a double kink. The two arms of the ureteral tube met at this point and the suture knot was placed on the upturned portion of the distal part of the ureteral kink, in order to provide a secure fastening by supporting the knot rather than by the angular kinking of the ureteral tube. The results were excellent.

In a case of accidental injury to the ureter during a radical Wertheim operation for carcinoma of the cervix, Ebeler[18] produced artificial compression of the ureteral lumen by kinking it about 1 cm. above its proximal end, ligating it with silk, and after a second kink allowing it drop down. The patient survived the operation thirty-six hours. Subsequent examination of serial sections showed that stenosis had taken place at the point above the ligature. While at the first kink the lumen of the ureter was only slightly compressed, the more distal part showed a high degree of compression, the condition pointing to an apparent incipient obliteration of the entire lumen.

Some of the troubles resulting from the treatment of ureterovaginal fistulas by reimplantation of the ureter are illustrated by Fraisse.[19] Three months after accidentally severing a ureter during a vaginal hysterectomy, he did an oblique implantation, suturing the ureter with fine catgut. A stubborn cystitis developed two years after the operation, and it was found that two fused stones had formed at the two ends of the ligature. A few months afterward three more pieces of the ligature were spontaneously passed by the patient. Eleven years subsequently a second attack of cystitis was thought to be due to a stone at the right angle of the vesical trigon. An incision into the bladder, under local anesthesia, demonstrated the erroneous diagnosis. The calculus had developed in the terminal portion in the efferent head of the injured ureter, a small canal which had formed acting as a deep diverticulum in the thick vesical wall. All traces of the suture threads had disappeared. The patient was placed in a semi-Fowler position immediately after the operation. Toward the thirty-fifth day she was allowed to recline full length in bed, and immediately a severe polynephritis and pyuria developed. It was concluded, of course, that the ureter had become permeable.

Goldberger[20] was more fortunate in the results of a retroperitoneal ureterocystotomy for ureterovaginal fistula, by high incision above Poupart's ligament. After locating the ureter he dissected it out as far as possible. The fistula, however, could not be reached in this way and Goldberger decided to "short-circuit" the urinary canal by transplanting the ureter above the fistula, leaving the fistulous part out of the canal and leaving the upper part of the ureter free in the wound. By means of a sound passed through the

14. Forssell: Centralbl. f. Chir., 1911, xxxviii, 1369.
15. McKechnie: Canad. Med. Assn. Jour., 1912, ii, 320.
16. Frankenstein: Gynäk. Rundschau, 1914, vii, 431.
17. Stoeckel: Ztschr. f. gynäk. Urol., 1911-1912, iii, 51.
18. Ebeler: Ztschr. f. Gynäk., 1913, iv, 181.
19. Fraisse: Paris Chir., 1913, v, 616.
20. Goldberger: Am. Jour. Surg., 1913, xxvii, 330.

urethra into the bladder, the fundus of the latter was pushed up into the wound and a small opening made into the bladder. The ureteral end was then split to avoid further constriction and stricture of the opening; the ureter was passed into the new opening in the bladder and fixed by a loop of suture on both sides. The bladder opening was then closed around the ureter and the latter fixed to the bladder with several interrupted sutures. A cigaret drain was inserted to provide for leakage. The peritoneum, being allowed to fall back into its natural position, covered the ureter, the bladder and all underlying structures. Recovery was good.

In a case of persistent fistula, resulting from the accidental inclusion of the ureter in the ligatures during a difficult pelvic operation, Barbat[21] (San Francisco) repaired the defect by implantation into a loop of the ileum, an operation already described by him in 1901. The old fistulous opening, near McBurney's point and leading back 3 inches, from which clear urine flowed, continued to discharge and a new one formed fourteen days after the operation, in the median scar. When the patient was examined two and a half years after the operation, the ureteral catheter passed only for 1½ inches. The cystoscope could not be passed into the lumen of the intestine, the opening of which appeared as a black hole. The patient was in good health and had gained in weight. The amount of urine secreted was normal, indicating that there was good functional activity of the kidney and that infection had not as yet taken place.

Conservation of the kidney is not always possible, and we find that Brongersma,[22] after resecting a portion of the ureter for myoma and implanting its central end into the bladder, was obliged to do a nephrectomy. The results, however, were good.

Much time and attention have been given to the study of the implantation of the ureter into the intestine since Chaput (1910) reported the first successful operation on man. His patients survived the intervention for periods varying from six months to five years. Beck,[23] in two cases, used the oblique method of implantation, modifying it by allowing the free portion of the ureter to dangle into the lumen of the bowel, hoping in this way to prevent infection, and by excluding the lumen from the cicatrix of the bowel to insure patency. In his first case, however, only one lumen remained patulous, the other being very much contracted. The patient did well for eighteen months and was able to control urine very satisfactorily. He came from a tuberculous family and later developed pulmonary tuberculosis. Up to the time of his return to the hospital with pyelitis, there was no indication of a return of the kidney trouble, and even then the lung condition was so much the more pronounced of the two disorders that Beck was not sure which of the two had caused death. In his second case the same operation was done except that Beck was obliged to implant the right ureter into the appendix. Recovery was prompt and the patient is able to control the urine for a considerable length of time. Only a few months have elapsed since this operation and the patient, Beck believes, will also develop pyelitis. But in the meantime the bladder will have had a chance to recover and reimplantation into the bladder may then be done should it be preferred to the present "tolerable condition."

Transplantation into the bowels is also the method of choice of Iljin,[24] who finds it more satisfactory than transplantation into the skin, apparently a favorite method with Russian surgeons. In eleven personal cases he obtained seven cures. There were four deaths, two of them being in children 14 and 17 months of age respectively. Postoperative treatment with a lactic acid ferment preparation for peritonitis and autogenous colon vaccine for pyelitis, gave good results in his cases.

"An ideal method" for obtaining aseptic conditions of the intestinal section and for minimizing the danger of ascending infection, is the term Dechanow[25] uses in describing a modified Maydl operation done by him in a case of vesical ectopia. He combined two modifications—anastomosis between the afferent and efferent end of the sigmoid flexure (Berglun and Borelius) and ligation of the afferent end immediately below the anastomosis (Mysch). A longitudinal incision was made into the sigmoid flexure below the ligature and the ureter placed in the wound of the isolated portion of the bladder, so that the orifice of the left ureter was directed upward and that of the right one downward, and the walls of the bladder and the intestines were brought into apposition. The intestine with the included ureter was dropped into the abdominal cavity. A large part of the abdominal wound was closed with two-tier sutures, while the lower defect was left open for future tamponage. A drainage tube was placed in the rectum. The operation lasted two hours, and the patient required transfusion. Recovery was established in six weeks, the patient being discharged in good condition. A small portion of the lower abdominal wound failed to heal. Dechanow proposes to cover this shortly with a flap from the scrotum.

Another modification of Maydl's operation is described by Dietlen.[26] He applied it in a case of vesical ectopia in a boy of 5 years. There had been a tumor present in the lower abdomen since birth. The navel was replaced by cicatrized skin and the tumor was located below this area, the inverted bladder, epispadias and a gaping symphysis completing the clinical picture. Operation consisted in dissecting off the bladder mucosa and extraperitoneal mobilization of the bladder, resecting the latter and leaving a small section (ureteral orifice). After the abdominal incision was made anastomosis was established between the two ends of the sigmoid flexure by an incision of about 4 cm. and the sigmoid colon clamped and ligated. An incision 4 cm. long was then made below the ligature into the sigmoid flexure and the remaining portion of the bladder with the colon opening sewed without tension. The patient was dismissed cured in six weeks, and has been free from trouble since.

The idea of anastomosis of the ureter and the appendix occurred to Babcock[27] in a case of advanced carcinoma of the bladder, and also to Kennedy[28] during an operation for carcinoma of the uterus. Kennedy was not able to carry out his plan owing to various complications, but subsequent study on the cadaver and on the dog demonstrated to him the feasibility

21. Barbat: California State Jour. Med., February, 1915, xiii, 70.
22. Brongersma: Centralbl. f. Chir., 1913, xl, 1300.
23. Beck, Carl: The Implantation of the Ureters into the Large Bowel, The Journal A. M. A., Nov. 8, 1913, p. 1691.
24. Iljin: Diss. St. Petersburg, 1913; abstr. Surg., Gynec. and Obst., 1913, xvii, 670.
25. Dechanow: Folia Urol., 1911-1912, vi, 666.
26. Dietlen: Inaug. Diss., 1913, Munich; abstr. Ztschr. f. Urol., 1914, viii, 413.
27. Babcock: Surg., Gynec. and Obst., 1914, xviii, 119.
28. Kennedy: Surg., Gynec. and Obst., 1912, xv, 464.

of the maneuver. The condition of Babcock's patient necessitated implanting one of the ureters into the rectum, so that only one was implanted into the appendix. He was a poor operative risk at best, and died two days after the intervention. Babcock does not believe that the uretero-appendiceal anastomosis possesses any great advantages, as it does not avoid contraction of the scar of the divided end of the ureter, the resulting stenosis being one of the main causes of renal infection after this type of operation.

A successful implantation of the ureter into the loin is recorded by Martin,[29] in a case of carcinoma which necessitated removal of the bladder and the uterus. With the exception of a tendency of the epithelium to cover the orifice of the ureter, which made dilatation necessary from time to time, the condition was all that could be desired. Symptoms of suppurative inflammation of the kidney sixteen months after the operation led to a nephrotomy, from which the patient made a good recovery and is reported well and comfortable seven months afterwards.

Implantation into the rectum with good results is reported by Arumugum,[30] of Bungalore, India, in two cases of extroversion of the bladder. Both patients were seen again four and a half years after the operation and both (the younger a boy of 13) were able to control urine five or six hours during the day and eight hours or more during the night.

The care of the ureters, we thus see, presents many difficulties and the "ideal method" has not yet been devised. Investigators are busily engaged in experimental studies that may possibly lead to the Eldorado of this branch of surgery. I regret that I can do no more than mention in this connection the excellent and brilliant work, among others, of our own Eisendrath,[31] Coffey,[32] Jones[33] and Barber;[34] that of Schmidt and Kawasoye,[35] in Germany; Chiasserini,[36] in Italy; Zaaijer,[37] in Holland; and the Russians, Shisko,[38] and Hjin.[24]

An unusual case of double ureters with intravesical ballooning of the lower ends is described by Young.[39] Both ureters opened into the bladder through a diverticular orifice. This diverticulum could be turned inside out at will, and whether so turned or not it was seen to be made up of a greatly dilated ureter. A plastic hernia operation was performed with apparently favorable results, as there was no evidence of intravesical ballooning when the patient strained. In a cursory review of the literature Young failed to find another like instance.

In a case presenting three ureters, one opening extravesically, Furniss[40] operated by making an incision into the mucosa, covering the under surface of the urethra over the catheter. Unfortunately the incision went into the much-dilated ureter. A sound was then passed into the bladder, and its mucosa and the mucosa of the sac were united with fine catgut in such a way that the distal end was obstructed. Thus the ureter was made to enter the sac, and from there to the bladder a fistula was formed. At a second operation, thirteen days after the first one, the ureter was dissected backward for 1½ inches. It had increased in size toward the renal end. A suture was placed through the end of the ureter and a sound passed into the bladder. This made the bladder bulge backward and to the left; a small incision was then made into this. The suture was held to the sound and the ureter pulled into the bladder, where it was held with one suture through the bladder and a part of the ureter. The suture pulling the ureter into the bladder was attached just below the clitoris. Postoperative cystitis yielded to treatment and recovery was perfect.

An aberrant, supernumerary ureter was treated by Hartmann[41] by resecting the dilated portion, freeing it for about 1.5 cm., and implanting it into the bladder per vaginam. The results were good. Subsequent cystoscopy showed that the implanted organ had become somewhat flattened. The two normal ureters were entirely independent of the implantation point.

Duplication of the ureters is not an unusual phenomenon, but the abnormality is frequently not suspected until some postoperative condition calls attention to the possibility of its existence. After an operation for cancer of the cervix, during the course of which Worrall[42] had traced the ureters to the bladder and isolated their pelvic portion, the meager amount of urine passed by the patient and her general poor condition led to the suspicion of the presence of double ureters, and that the main canal on each side had been tied. A second operation was done. The ureters were easily located, as they were both dilated above the ligatures. They were disinterred and after splitting their ends, were implanted into the bladder close to the other ureter on each side, which could be plainly seen. Leakage persisted for several months, but complete recovery was finally established seven months after the operation.

While operating in a case of carcinoma of the rectum, Samborski[43] found reduplicated ureters separated from the surrounding tissue and connected with each other by the intervening cellular tissue. He transplanted the two organs as one; the cellular tissue connecting them served conveniently for attaching them to the intestines. The fold of the rectum covered both ureters as if they were one body, and the orifices of the two ureters were sutured in as one, with a single opening of the rectum. The right (single) ureter was somewhat dilated; this was also sutured into the rectum. Metastatic lesions were found in the right ureter. The patient did well up to the twelfth day, when he gradually began to fail, though there was no rise in temperature. Death ensued on the seventeenth day.

Intravesical cysts, while not very rare, have not frequently been diagnosed by means of the cystoscope as Gayet[44] was able to do. He removed the growth by a hypogastric incision, a method not usually employed for the purpose. After the incision was made, the cyst could be seen in the right ureter and the fluctuation of the tumor showed that urine had found its way into the cyst, although no orifice could be detected. An incision was made at the base of the tumor and a

29. Martin: Ann. Surg., 1911, liii, 423.
30. Arumugum: Am. Jour. Surg., 1911, xxv, 169.
31. Eisendrath, Daniel N.: The Repair of Defects of the Ureter, THE JOURNAL A. M. A., Nov. 8, 1913, p. 1694.
32. Coffey, R. C.: Physiologic Implantation of the Severed Ureter or Common Bile Duct into the Intestine, THE JOURNAL A. M. A., Feb. 11, 1911, p. 397.
33. Jones: Am. Jour. Obst., 1914, lxx, 329.
34. Barber: Ann. Surg., March, 1915, p. 273.
35. Kawasoye: Ztschr. f. gynäk. Urol., 1913, iv, 107.
36. Chiasserini: Policlinico, Rome, 1912, xix, sez. chir., p. 247.
37. Zaaijer: Beitr. z. klin. Chir., 1915, xciii, 235.
38. Shisko: Vrach. Gaz., St. Petersb., 1913, xx, 1604.
39. Young: Tr. Am. Urol. Assn., 1912, vi, 161.
40. Furniss: Med. Rec., New York, 1914, lxxxv, 589.
41. Hartmann: Ztschr. f. Urol., 1912, ii, 83.
42. Worrall: Jour. Obst. and Gynec., 1914, xxvi, 159.
43. Samborski: Russk. Vrach, 1913, xii, 568.
44. Gayet: Lyon méd., 1912, cxviii, 1460.

pouch, from which a certain amount of urine escaped on pressure, was removed. A crown suture of fine catgut was placed at different points through the ureteral and the vesical mucosa. The bladder was sutured and space allowed for drainage tube. A permanent catheter was introduced. On examination of the pouch, the orifice could be located only by means of a magnifying glass. The lesion was evidently a congenital one.

Pietkiewicz[45] attributes cystic dilatation of the vesical ends of the ureters primarily to a stenosis of the ureteral orifice, and resulting in urinary stasis in the lower portion of the ureters. He describes two such cases with prolapse of the ureter through the urethra. This is perhaps one of the most unusual diseases of the urinary system. Ten cases have been reported as occurring in little girls, but Pietkiewicz knows of only two other cases besides his own, one reported by Simon and the other by Hartmann, in Jena. Diagnosis was made at operation in all these cases. Pietkiewicz was the first to use the high incision for the operation (1909).

The tumor in his first case was seen on examination at the dilated meatus of the urethra, and preliminary treatment consisted of removal under light narcosis. At cystoscopic examination the tumor was seen, the base of which covered the greater part of the trigonum. The right ureteral orifice was not visible. The left one appeared in the form of a club-shaped pulsating protrusion, the point of which was concave with a tiny, scarcely visible, ureteral opening. At operation the cavity of the cystic dilatation was found to communicate directly with the dilated lumen of the ureter. The walls of the growth were dissected off and the wound closed with sutures. A wide gaping orifice was now visible, from which urine flowed periodically. Cystoscopy a week later showed normal bladder mucosa and the urine flowing in a rhythmic stream from a normal ureteral orifice. The correction of the stenosis on the other side was postponed for another occasion. In the second case described by Pietkiewicz, the bladder tumors were unusually large and the condition was complicated with pyelonephritis. The tumors were removed at several sittings, without anesthesia, by means of a knife encased in a blunt-end metal sheath introduced through the urethra. All symptoms disappeared as soon as the stenosis at the ureteral orifices was removed.

Pietkiewicz sketches the pathologic process thus: The club-shaped protrusion (Case 1) of the left ureteral cushion represents the initial stage of the dilatation, the pear-shaped tumors of Case 2 being the second stage. The condition around the ureter in Case 1 showed that the right kidney was secreting urine, but no regular rise and fall of the tumor could be noted after the prolapse had been corrected. This stationary form, which differs little from a genuine cyst, would represent the last stage of the dilating process. As long as the dilated ureteral end remains in the first or in the second stage, that is, as long as the walls of the tumor retain their muscular function and take an active part in the ureteral peristalsis, there is little or no danger of a prolapse. It is the third stage, when the tumor has attained a certain size and its walls have lost their muscular power, that represents a favorable condition for prolapse. The dilated end of the ureter may easily be carried by the force of the urinary flow into and occasionally tampon the inner urethral orifice. The urinary troubles that result force the patient to help by means of pressure and bring about the prolapse.

Algave and Papin[46] describe a case in which the ureter abnormally opened into the urethra and had caused enormous dilatation of the pelvic and lumbar regions. They succeeded in passing the catheter into the abnormal orifice, which seemed dilated into a wide pouch, from which pus was evacuated. The collargol picture showed that this abnormal ureter was markedly dilated for its entire length. The kidney was fused with the suprarenal capsule and was removed with difficulty. These authors seem to think that this condition is a more frequent occurrence than is generally supposed, and that it is seen more often among woman than among men.

Juvara[47] mentions a case of aberrant ureter opening into the vulva to the right of the ureteral orifice. The abnormal canal was found to join the ureter at a sharp angle directly below the kidney pelvis. It was resected for a distance of 18 cm. Under the microscope it presented typical ureteral structure.

Hernia of the ureters is not frequent. Gilberti[48] has collected reports of thirty-three cases. He advises burial of the ureter into the bladder as the most successful procedure when conditions permit.

REPORTS OF CASES

Case 1.—Mrs. W., aged 27 years, was admitted to the Jefferson Hospital complaining of pain in the right lumbar region. There is a family history, on the maternal side, of cardiorenal disease for several generations back. The patient herself, with the exception of an attack of pneumonia at 24 years, had always enjoyed good health. She is the mother of two healthy children, 12 and 9 years of age. Menstrual periods have always been more or less painful.

Her present trouble dates back two years, with the sudden onset of pain in the right lumbar region, radiating along the course of the ureter into the right labia. Intermittent attacks (usually coming on before the menstrual period) have recurred since then with more or less violence. Of late during the greatest distress the pain radiates to the left labia and the left thigh; there is some dyspnea, and urine seems to be decreased followed by an increased flow. The attacks last several hours and are always followed by nausea, vomiting, soreness and exhaustion.

The left kidney could not be palpated at examination. A smooth mass, moving with respiration, was palpated in the right hypochondrium; tenderness was marked over the right kidney.

Cystoscopic examination showed a normal bladder; the ureteral orifices were also apparently normal. The pyelogram disclosed a displaced right kidney, small stone in the kidney pelvis, kinked ureter and hydronephrosis. In the left kidney region there was no collargol shadow seen, which suggested a unilateral right kidney.

At operation the kidney was approached through the Koenig incision. The upper part of the ureter was distended and kinked, the elbows of the kink being firmly adherent. The renal pelvis was also much distended. When the adhesions surrounding the kidney and ureter were loosened up, the second ureter was found and traced to the extreme upper portion of the dilated kidney pelvis. The pelvis was then incised, and, after the calculus was removed, a part of the renal pelvis was resected and repaired by double-line suture. A nephropexy was then done—four sutures, two on either side through the renal capsule, incorporating a small amount of cortex—and the organ sewed in position. Considerable

45. Pietkiewicz: Ztschr. f. gynäk. Urol., 1910-1911, ii, 261.

46. Algave and Papin: Bull. et mém. Soc. de chir. de Paris, 1913, xxxix, 110.

47. Juvara: Bull. et mém. Soc. de chir. de Paris, 1913, xxxix, 100.

48. Gilberti: Riv. veneta di sc. med., 1913, lviii, 86.

fat and fascia were transplanted along the ureter at the site of kinking in order to prevent another angulation. After the kidney was fixed, the position of the ureter at its outlet from the pelvis was found at the lowest point of the repaired renal pelvis. The second ureter was traced down to the lumbar vertebra, where it crossed over to the left side, entering the bladder approximately in a normal position. This ureter was ligated and resected. The patient made an uneventful recovery, being discharged five weeks after operation. When seen again eleven months later, she was in the best of health, and had had no recurrence of the renal pain.

CASE 2.—H. M. P., aged 32 years, came under observation Sept. 13, 1913, with a history of repeated attacks of left renal colic, during the past eighteen months, increasing in severity as time went on. Five roentgenograms taken during this period, as well as a sixth one after his admission to the hospital, all gave a negative picture. The catheter introduced into the left ureter met an obstruction at about 10 cm. from the orifice. The stricture, thus found, was treated by gradual vesicle dilatation for one month on alternate days, resulting in relief. The patient was dismissed apparently well. Another severe attack during the next month obliged him to return for further treatment. It was now decided to explore the ureter. The incision was made along Poupart's ligament and the great vessels exposed at the ileosacral junction. The ureter was easily recognized, a catheter having been previously inserted. The ureter was dissected from its peritoneal attachment to the point of narrowing, above which it was somewhat distended; a small stone was detected on palpation and removed through a longitudinal incision approximal to the stricture; the incision was continued for about 1.5 cm., dividing the stricture freely. A transverse line of two-tier sutures was inserted, increasing the constricted lumen beyond that of normal caliber. The wound was closed with a cigarette drain to provide against leakage. No leakage occurred; the patient made an uneventful recovery and is well, one and a half years after operation.

I desire also to report a case of successful implantaken of the ureter into the loin.

CASE 3.—W. B., hotel clerk, aged 33, came under observation, November, 1904, with a history of sudden attack of severe renal colic, referable to the right kidney. The patient had had four severe attacks prior to his admission into the hospital. By palpation over the right loin a large painful mass was detected. The urinary analysis showed a large quantity of pus and red blood cells. The Roentgen ray revealed a shadow of a good-sized stone in the pelvis of the kidney. The patient was profoundly toxic. At operation pyonephrosis was found, with stone in the pelvis. It was decided, owing to the grave condition of the patient, to drain the kidney, preliminary to doing a nephrectomy. It was also found convenient at this time to bring the ureter into the loin, where it was fixed in position with a few interrupted sutures, with a view of expediting the secondary operation. The patient improved rapidly and refused further operation. He was discharged from the hospital the thirty-third day following his admission. Nearly twelve years have elapsed since the ureteral implantation. The patient has enjoyed the best of health and says that he does not experience much inconvenience from the urinary drain in the loin.

1819 Walnut Street.

Rufus of Ephesus.—To generations of practitioners unworthy to hand him ligatures Rufus of Ephesus (Reign of Trajan, early part of second century A.D.) was known by the "pilulae Ruffi," "the pills I would not be without"—"pilulae sine quibus esse nolo"—still in the British Pharmacopoeia as the pill of aloes and myrrh. In the brilliant Ionian profession of the early days of this era Rufus doubtless had predecessors and teachers, but he stands out a strong, clear figure, a great "magister chirurgiae," a title justly earned by his remarkable contribution to the surgery of haemostasis.—Osler.

URETERO-ENTERIC ANASTOMOSIS

A FURTHER EXPERIMENTAL STUDY *

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The problem of the disposition of the ureter that has been separated from the bladder by accident or reason has engaged the attention of many thoughtful and ingenious surgeons for the past sixty-five years. The feat has been attempted from different points of view. To prevent peritonitis, Lloyd and Simon[1] worked extraperitoneally. To preserve the immediate ureteral vesical relations, Pisani, Peterson,[2] Maydl and Moynihan transplanted both of the ureters and the adjacent portions of the bladder involving the area of the trigonum vesicae. To accomplish both at once, Bergenhem[3] removed the ureterovesical rosettes separately and extraperitoneally.

Again, to protect the transposed ends of the ureters from contamination by the fecal stream, Gersun,[4] Tizzoni, and Pozzi substituted for the bladder evaginated intestine and transplanted the severed ureters into it. Martin,[5] Kryinski,[6] Fowler,[7] Boari[8] and numerous others, without removing any portion of the bladder or without creating one artificially, anastomosed the ureters to the lower bowel directly. They endeavored to elaborate a defensive barrier in the union of the extreme caudal ends of the ureters with the normal bowel. Tuffier, Coffey[9] and Beck[10] attempted the same result, but allowed the ureteral ends to protrude into the intestinal lumen. All these workers[11] have striven to produce, largely through anatomic study, a perfectly functionating entero-ureteral anastomosis.

Reviewing these different technics in entirety, they appear to have been suture methods (with the possible exception of Boari's, in which a button was used) and contrivances retaining the ureterovesical valve or its equivalent. Especially painstaking seem to have been the efforts spent to create resistance at the caudal end of the ureter equivalent to that presumably present in the normally intact ureter. Fowler[7] pertinently criticized the Maydl operation for "making no allowance for the changed pressure conditions of the rectum" and for involving "extensive dissection," and Kryinski's method in that the "pressure exerted was fallacious in accomplishing the result" desired, while at the same time Fowler buried his ureter for an arbitrary distance and consequently with an unknown

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* From the Laboratory of Experimental Surgery, New York University and Bellevue Hospital Medical College.

1. Simon, Lancet, London, 1851, ii, 375.
2. Peterson, Reuben: Anastomosis of the Ureters with the Intestine: An Historical and Experimental Research.
3. Buchanan, J. J.: Remote Results of Bowel Implantation of the Ureters into the Bowel for Exstrophy: A Consideration of the Extraperitoneal Method of Bergenhem, Surg., Gynec. and Obst., 1909, viii, 146.
4. Gersun: Wien. klin. Wchnschr., 1898, No. 43, p. 990.
5. Martin, F. H.: Implantation of the Ureters into the Rectum, THE JOURNAL A. M. A., April 1, 1899, p. 709.
6. Referred to by Connell, F. G.: Exstrophy of the Bladder, THE JOURNAL A. M. A., March 9, 1901, p. 637.
7. Fowler: Implantation of the Ureters into the Rectum in Exstrophy of the Bladder, with a Description of a New Method of Operation, Am. Jour. Med. Sc., 1898, cxv, 270.
8. Boari: Ann. d. mal. d. org. genito-urin., 1896, xiv, 1.
9. Coffey, R. C.: Physiologic Implantation of the Severed Ureter or Common Bile Duct into the Intestine, THE JOURNAL A. M. A., Feb. 11, 1911, p. 397.
10. Beck, C.: Chicago Med. Recorder, November, 1899.
11. Ricketts, B. M.: Surgery of the Ureter: an Historical Review, 1905, p. 1585. Hartley, F.: The Operative Treatment of Exstrophy of the Bladder. See also Footnotes 2 and 6.

resistance in the muscular fibers of the rectum. Coffey[9] called his enteric implantation of the ureter "physiologic," while simulating the anatomy of the ureterovesical termination. The latter method has been followed by C. Mayo[12] in four cases recently reported by him. It seems to me, however, that the physiology of the ureter has for the greater part been disregarded, for it is believed at the present day that the ureterovesical valve is negligible physiologically. This dissimilarity between the pressure conditions of the intestinal tube and the closed urinary bladder further emphasizes the impertinence of a vesical ureteral termination in the bowel.

A further objection to all the operations to date is appropriately described by Matas,[6] thus:

> The operator who cuts off both ureters from the bladder and transplants them into the colon, must experience a certain and unavoidable anxiety—an anxiety that only further experience will overcome, that is born of the feeling that he has burned his ship behind him and has staked all his patient's chances, all his hopes, in the hazard of the game. It is the utter hopelessness of remedying the evil that must make any conscientious operator vacillate many times over before deciding to embark on so perilous an undertaking.

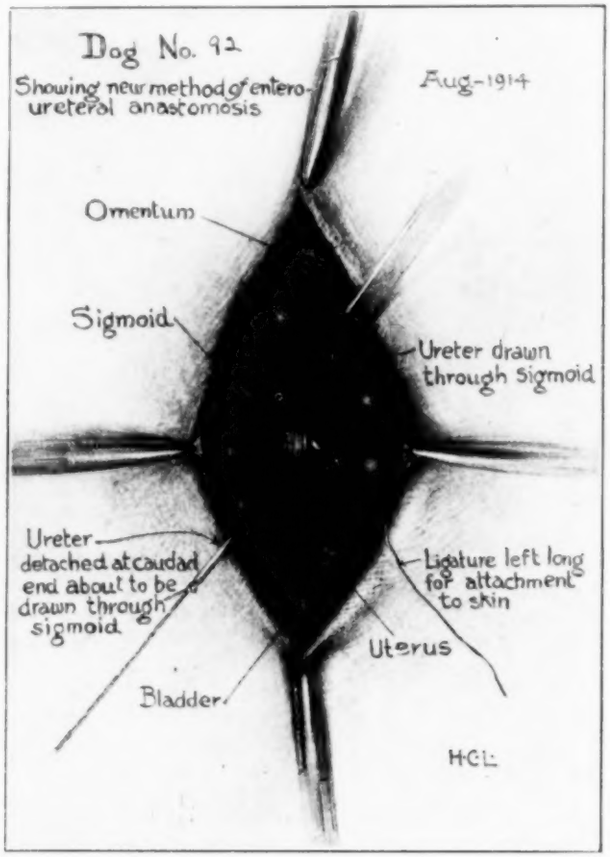

Fig. 1.—New method of entero-ureteral anastomosis.

Fig. 2.—Ventral view.

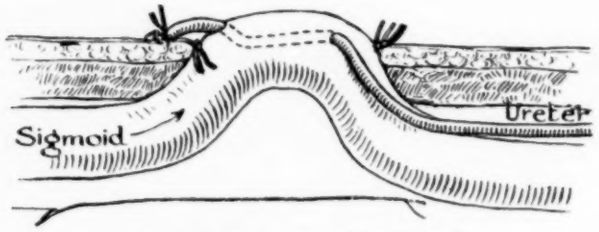

Fig. 3.—Lateral view, semidiagrammatic.

A number of salient physiologic facts were brought out by our laboratory studies during the past two years. It was determined by Draper and Braasch[13] at the Mayo Clinic in 1911 that the ureterovesical valves may be destroyed in the presence of purulent cystitis without probable kidney infection. It was evidently probable from the studies[14] presented at Atlantic City in June, 1914, that of the two factors, namely, the ureteral peristalsis and the mechanism of the ureterovesical valve, the peristaltic factor is often the vitally important one in the determination of a possible renal infection. Furthermore, it was shown that when this ureteral function was seriously impaired, amounting virtually to a ureteral paralysis, and the ureterovesical valve function was left intact, hydronephrosis followed in 75 per cent. of cases.[15] The latter experiments have been repeated during the past fall with the following results:

In Dogs 16 and 17, the infected vesical body had become a ureteral calculus. The expected results followed in a more accentuated form, but because of this new variant, these experiments have been omitted from consideration.

Dogs 6 and 22 are negative.

Of the remaining, 50 per cent. are hydronephrotic and 83⅓ per cent. are hydronephrotic or have dilated ureters. These results may be seen to compare favorably with those already referred to.

Hence, it appeared that an operation to have substantial functional value must, above all, involve the least possible traumatization of the ureter. Furthermore, it must be granted that some degree of traumatization is inevitable and that its peristaltic efficiency is proportionately impaired. Therefore the caudad resistance must be proportionately decreased if the ureter is expected to empty itself. For this reason, not only the resistance of a normal valve appeared too

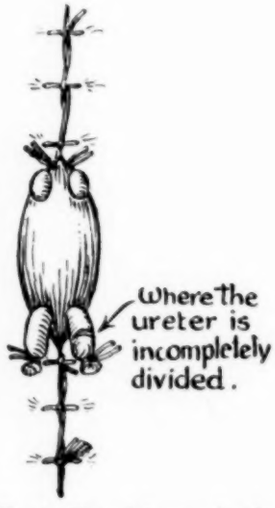

Fig. 4.—Distended ureteral ends.

12. Mayo, C.: Exclusion of Bladder, an Operation of Necessity, Collected Papers of St. Mary's Hospital, 1913.
13. Draper, J. W., and Braasch, W. F.: The Function of the Ureterovesical Valve, The Journal A. M. A., Jan. 4, 1913, p. 20.
14. Barber, W. H., and Draper, J. W.: Renal Infection: A Further Experimental Study of Its Relation to Impaired Ureteric Function, The Journal A. M. A., Jan. 16, 1915, p. 205.
15. Stewart and Barber: Hydronephrosis: An Experimental Study, Ann. Surg., December, 1914.

great, but also all resistance arising from artificially created plastics appeared too great. The problem then remains: How anastomose the ureters with the lower bowel with the least interference with their peristaltic function and with the establishment of caudad resistance physiologic for them in their necessarily impaired states?[16]

TABLE 1.—REPORT ON SECOND SERIES OF URETERAL TRAUMATIZATION, DEC. 7, 1914

Dog No.	Days of Life	Pathologic Condition of Urinary Tract
23	50	Dilatation of cephalad ureter cystitits
6	23	Purulent cystitis
16	12	(Abdominal organs negative.) Left hydronephrosis; hydro-ureter; pyelonephritis. Right pyelonephritis. Sup. cystitis; acute vesical retention; urethral calculus.
14	15	Left hydronephrosis; cystitis
17	15	Cong. kidneys. Left hydro-ureter; cystitis; urethral calculus
13	15	Cong. kidneys; cystitis. Dil. of cephalad ureter
15	14	Left hydronephrosis; cystitis
24	9	Left hydro-ureter; hydronephrosis; cystitis
80	21*	Left hydronephrosis; cystitis
82	11	Left pyonephrosis; hydro-ureter; cystitis
5	50*	Left dil. of cephalad ureter; cystitis
22	10*	Negative
83	20*	Left hydro-ureter
81	16	Left hydronephrosis; hydro-ureter; cystitis

* Etherized.

The following operation represents an attempt to correlate the experience of others with the recently obtained physiologic knowledge of the ureter:

A mesoventrad incision is made in the lower abdomen. The bladder is drawn toward the wound. One or both ureters may be created as follows: identify, doubly ligate, and cut between ligatures; attach a large, straight cutting needle to the cephalad end by its ligature, and penetrate the sigmoidal wall in the plane of the mesenteric reflection. Drive the needle with the aftercoming ureter obliquely for from 1.5 to 2 cm. through the wall, with the colon held on the stretch. At a point approximately 1 cm. obliquely distant from the point at which the needle enters the lumen of the sigmoid, penetrate the colon perpendicularly, drawing the ureter out on the skin. Suture the ureter to the skin by its ligature and close the wound about that part of the sigmoid traversed by the ureter. It is of advantage to strip the ureter in its caudad one fourth and to free the distal two fourths digitally to avoid angulations, torsion or harmful tension. It is important to see the ureteral ends distended before the closure of the abdominal wound in order to make certain that the urine flow is not obstructed. It is convenient to divide the ends incompletely to free the urine after completion of the operation, although this may be delayed six hours apparently without resultant ureteral or renal injury.

The technical results of this procedure may best be appreciated by a review of the experimental series tabulated herewith.

The following points with reference to Tables 1 and 2 are noteworthy:

1. The results of the preceding operations are operative only, for none of the animals received postoperative surgical attention.

2. Plus physiologic caudad ureteral resistance is manifested first by dilatation of the cephalad end of the ureter.

3. Continued incomplete ureteral obstruction leads to a dilatation of the second and third portions of the ureter and a dilatation of the renal pelvis.

4. Direct ureterosigmoidal entrance is more obstructive than the oblique entrance and the more oblique (from 1 to 2 cm.) the less that obstruction.

CONCLUSIONS

1. Ureterosigmoidal plastics are tedious for the operator and unsafe for the patient.

2. Operations in which the caudad ends of the ureters are allowed to protrude freely or fixedly within the sigmoid are meritorious in so far as the intramural portions of the ureters are unobstructed. Time spent in elaborating the terminal relations of the ureters is therefore valueless.

3. Oblique entrance from 1.5 to 2 cm. and the least foreign substance including blood and injured tissues are conducive to the least reactive inflammatory occlusion of the intramural portions of the ureters. These are most conveniently accomplished by the needle and ligature.

Fig. 5 (Dog 199 B 2).—Left kidney with foci of infection and right kidney normal fourteen days after transplantation of left ureter perpendicularly and right ureter obliquely for 2 cm. into sigmoid. Note sacculation of sigmoid with caudad ends of ureter firmly embedded in its mesenteric wall.

16. Barber: Uretero-Enteric Anastomosis, Ann. Surg., March, 1915. In addition to the foregoing references, the following may be consulted:
Reynolds, Edward: A Case of Vesical Implantation of the Ureter by Dudley's Forceps Method After Failure of Several Plastics, Boston Med. and Surg. Jour., Jan. 24, 1901.
Cabot: Am. Jour. Med. Sc., 1892, ciii, 43.
Harrison: Lancet, London, 1897, p. 1091.
Matas: Treatment of Exstrophy of the Bladder by Making a Receptacle for the Urine out of the Lower Cecum, Utilizing the Appendix for the Urethra, Zentralbl. f. Chir., Aug. 13, 1910.
Thomson: Ztschr. f. Geburtsh. u. Gynak., 1893, p. 173.
Bottomley, J. T.: Operative Treatment of Exstrophy of the Bladder by Transplantation of the Ureters on to the Skin of the Loin, THE JOURNAL A. M. A., July 13, 1907, p. 141.
Berg: Treatment of Exstrophy of the Bladder, Nord. Med. Ark., Surg. Sect., 1907, No. 1.

4. By leaving the ureterosigmoidal field exposed, an enteric diverticulum is formed for urinary storage, and the ureters remain accessible to investigation if desirable.

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We tried direct implantation of the ureter experimentally and found that in every instance ascending infection and destruction of the kidney took place. We used the indirect or submucous implantation and found that in not one did dilatation take place. Of nine dogs, three died of perito-

TABLE 2.—SUMMARY OF EXPERIMENTAL DATA INCIDENTAL TO A STUDY OF URETERO-ENTERIC ANASTOMOSIS

1. Unilateral Transplantation

Dog No.	Technic	Duration of Ex. in Days	Pathologic Condition	Conclusion
311	Maydl	4	Sloughing of transplant; peritonitis	Technical failure
299	Maydl	3	Ureteral stenosis; soiling; peritonitis	Technical failure
19	Direct anastomosis to aboral end of cephalad third of colon; ureter traumatized	6*	Caudad stenosis; hydro-ureter; hydronephrosis; marked injection of colon	Plus caudad ureteral resistance; oral colon intolerant to urine
33	Oblique anastomosis for 0.5 cm. to caudad third of colon	7*	Omental adhesions; hydro-ureter; hydronephrosis	Plus extra-ureteral resistance
34	Direct anastomosis	26	Caudad stenosis; hydro-ureter; hydronephrosis	Plus caudad resistance
45	Oblique; 0.5 cm. to caudad colon; least traumatization of ureter	26*	Caudad stenosis; hydro-ureter; hydronephrosis	Plus caudad resistance
46	Direct; ureter traumatized	5	Necrosis of ureter from overtension; hydro-ureter; hydronephrosis	Plus caudad resistance
47	Oblique; least traumatization of ureter	5*	Caudad stenosis; hydro-ureter; hydronephrosis	Plus caudad resistance
50	Oblique; 0.5 cm.; least traumatization; digital freeing of ureter	17	Caudad stenosis; hydro-ureter; pyonephrosis	Plus caudad resistance
51	Direct; traumatization	32	Caudad stenosis; hydro-ureter; hydronephrosis	Plus caudad resistance
	2. Bilateral Transplantation			
92	Direct; least traumatization	3	Leakage from right; caudad stenosis in left	Right) compression and sloughing. (Left) plus caudad resistance
109	U-catheter used	4	Perforation by catheter; peritonitis	Stiff catheter dangerous
136	Oblique; least traumatization	?	(Records incomplete)	
137	Catheters used; oblique	?	Sloughing of ureter; peritonitis	Overtension of ureter
130	Oblique; traumatization	7	Left dilated ureter; kidney congested. Right plus dilated ureter; edematous kidney	Caudad resistance less, but still plus physiologic
147	Oblique; 1 cm.	9	Pneumonia. Left ureter distended. Right ureter dilated slightly caudad	Anastomosis well balanced
178	Oblique; 1.5 cm.; digital freeing	5	Ureters dilated cephalad; pelves dilated; kidneys edematous	Resistance too great for impaired ureters
186	Oblique; 1.5 cm.	7	Left ureter dilated plus cephalad; pyonephrosis. Right ureter dilated slightly cephalad; kidney normal	1.5 cm. adequate resistance
187	Oblique; 1.5 cm.	9	Left ureter dilated cephalad; pelvis dilated slightly. Right ureter dilated caudad	1.5 cm. adequate resistance on left side; ? on right side
188	Oblique; 1.5 cm.	10	Ureters left intact on skin; therefore:	Resistance plus
199	Right oblique; 2 cm.; freeing of caudad third. Left direct	17	Right normal ureter and kidney. Left pyonephrosis	Right; resistance adequate Left; resistance plus

* Etherized.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. BRAASCH AND MOORE, LOUX, BARBER AND CABOT

Dr. Robert C. Coffey, Portland, Ore.: In a paper published in the December, 1909, *Annals of Surgery*, p. 1238, we showed by experiments on six dogs that when the bile duct was reimplanted into the duodenum by direct implantation it was invariably found dilated when seen at a later operation. In one instance it was as large as the intestine. In six dogs in which the duct was made to run directly under the mucous membrane for some distance before emerging into the lumen of the intestine, no dilation of the duct took place. The only rational conclusion is that a valve is necessary to protect the duct from intra-intestinal pressure. We reported this at the meeting of the Southern Surgical Association at Hot Springs, Va., five years ago, and at that time suggested that it was probable the ureter could be implanted in the same way with the same results. We tried direct implantation of the ureter experimentally and found that in every instance ascending infection and destruction of the kidney took place. We used the indirect or submucous implantation and found that in not one did dilatation take place. Of nine dogs, three died of peritonitis due to faulty technic. None of the six surviving had ascending infection of the kidneys five months later. I exhibited the kidneys at St. Louis in 1910, showing these results. The technic of the operation with illustrated results were published in The Journal, Feb. 11, 1911. As will be seen by these illustrations, a probe could be passed into the duct running under the mucosa demonstrating the valve. No one had previously succeeded in implanting the ureter into the intestine of a dog in such a way as to prevent ascending infection.

Dr. Charles Mayo was the first to apply this technic in the human. He has had six patients in whom he has implanted twelve ureters into the intestine. He does the operation in three stages; first, one ureter, later the other ureter, and finally removes the bladder. He has had no deaths and no ascending infection. The patients are in good condition. All have been for exstrophy of the bladder. I have had two cases with implantation of three ureters. One was made

necessary by the removal of 4 inches of the left ureter during an operation for uterine cancer. The patient died of recurrence nine months later. I did not get the kidney but was informed that it functionated to the last without evidence of trouble. This was a trying case, as the ureter was dilated when the operation was done. My other case was one of exstrophy in a 2-year-old child. One ureter was implanted into the sigmoid Jan. 3, 1914; the other three months later. The child is now in perfect health, eighteen months after operation. Thus with Dr. Mayo's twelve and my three implantations we have fifteen ureterosigmoid implantations without death or ascending infection, as far as can be determined.

DR. BRANSFORD LEWIS, St. Louis: I want to congratulate Dr. Braasch on the number of cases in which he has removed a stone from the ureter by cystoscopic methods—sixty-four cases. That is a good many more than I have done, but I am working up to that number gradually. For a number of years I have been advocating such a procedure before subjecting a patient to laparotomy. Some of you may be interested in the developments that have been made on that subject, and the several instruments that have been submitted by various authors to accomplish such a result. I am yet to be convinced that it has any legitimate danger. One contributor at the Pan-American Congress last week mentioned that he had, previous to operating, run in a stiff instrument of some sort and he had penetrated the ureter, and in operating he had been surprised to find out that it was outside of the ureter instead of inside. I do not think that comes within the scope of what might be expected. One should use instruments which are not of sufficient strength or stiffness to do that kind of damage.

Wappler of New York has lately constructed for me a ureteral dilator that has enabled me to go up into the ureter four or five inches, and by a special method I am permitted to dilate the narrowed part of the ureter. This is modelled like a Kollman urethral dilator, using two prongs instead of four, with a blunt end that is brought into contact with the stone, and then gradually, under the control of the operator on the outside, by means of the handle, the dilator is forcibly distended. In certain cases I have been able to get the stone down with this dilator when I had been unable to do so by other instruments and technic. This I consider an advance. Undoubtedly there have been several hundred cases that have been successfully reached in this way, which is sufficient evidence that these methods should be applied or resorted to before a kidney operation is had.

DR. FRANK HINMAN, San Francisco: It seems to me that the significant feature in the analyses of these cases by Drs. Braasch and Cabot is the finding by one of 17 per cent. absence of blood and pus, and by the other of about 20 per cent. It is usual to consider absence of blood and pus after careful microscopic examination as strong presumptive evidence of the absence of stone. Both of these men also report a high percentage of failures of the Roentgen ray, considered by Dr. Cabot as being as high as 20 per cent. The symptoms, as shown by these analyses cannot be relied on for diagnosis. Therefore, we must have other means of diagnosis of stone in the ureter. The absence of blood and pus cannot be given much significance if absent in over 20 per cent. of cases, and the failure of the Roentgen ray in over 20 per cent. of cases means that a negative Roentgen ray does not eliminate the possibility of stone. The use of the wax-tipped catheter has not been mentioned, but it is the most accurate means of diagnosis at our command and should be used in every doubtful case. I wish to report a practical and simple method of application of the wax-tipped catheter in the male. A soft rubber urethral catheter, (No. 9 or 10 F.) which passes loosely through the operating telescope of the cystoscope, is cut off and slit up at one end so that when these ends are turned back over the telescope entrance they will hold the sheath in position with its distal end just beyond the lever of the instrument. The wax-tipped catheter may be passed through this rubber sheath without any danger of scratches from the lever or beak of the instrument, and this has the added advantage that several waxed tips may be passed at the one time and all withdrawn for examination without previously withdrawing the cystoscope. Functional study and pyelography may also be done at the one cystoscopy.

DR. JOHN W. DRAPER, New York: I am interested very much in the subject from the standpoint of experimental surgical physiology. I had the privilege of working with Dr. Braasch on the matter of this valve. The work was started by Dr. Lewis originally. I do feel that we showed conclusively by our experiments that the valve was of very little value. Its protective power against renal infection is perhaps about 10 per cent.; that of the physiologic integrity of the ureter itself, 90 per cent. I am therefore very much interested in listening to the discussion of the members of the section on this subject. Dr. Coffey's work is certainly a very important one and I congratulate him on its success. I feel that whatever the outcome of these studies may ultimately be, a great deal of credit is due to Dr. Coffey for the experimental work that he has done. Equal credit is also due for the more extensive experimental work that Dr. Barber has done.

I think, Mr. Chairman, a very important part of Dr. Barber's paper which may not have been made clear is the relationship which he draws between the neuromuscular tubes of the genito-urinary system and of the alimentary canal, in reference to dilation. Those matters in the future should receive more attention than they have in the past, and dilatations of the hollow viscera can be understood only through the interpretation given by comparative mammalian experimental studies. The close relationship between, a dilated stomach and a dilated kidney will thus become clear.

DR. GRANVILLE MACGOWAN, Los Angeles: Dr. Cabot, what do you mean exactly when you say that your patients are not well after the operations?

DR. CABOT: I mean they are not cured of their difficulties. A majority of the patients who were reported as well now have stone in the kidney.

DR. MACGOWAN: Did you originally take all of the stones out of the kidney or have new stones formed?

DR. CABOT: I have no data on that.

DR. MARTIN KROTOSZYNER, San Francisco: In connection with Dr. Cabot's statement that in 14 per cent. of his cases of nephrolithiasis no blood or pus could be found on repeated and persistent urinalysis, I would like to ask if the search was made immediately or shortly after an attack of kidney colic? I have always looked on the findings of microscopic blood after an attack of renal colic as an important and, occasionally, the only guide to a correct diagnosis.

DR. HUGH CABOT, Boston: Dr. Barber's work seems to me an important piece of experimental work on the question of the formation of a valve, and yet I do not believe that the creation of a valve will prove to be a matter of any importance.

I am thoroughly familiar with Dr. Coffey's work, which was based on a most ingenious conception, skilfully worked out. He has just commented on the fact that the common duct, and I believe also the ureter, was found dilated above the implantation when done by former methods, and he therefore concludes that this is satisfactory evidence of undue resistance at the intestinal end. With this conclusion I am unable to agree. We have, during the last four years, had a good many cases in which implantation of ureters was necessary and the most striking single fact has been the regularity with which dilatation of the ureter has occurred, even in the entire absence of stricture at the lower end. Dr. Barber's paper suggests to me that this dilatation is due not to obstruction, but to injury to the nerve supply of the ureter. We are dealing here with an active muscular organ and not a simple conducting tube. Its nerve supply is unquestionably segmental, and injury to this nerve supply is likely to be followed by paralytic dilatation. This paralytic dilatation will readily become an objectionable source of obstruction. That obstruction in some form is a factor of importance in causing renal infection may readily be

admitted without assuming that it is the only or the most important factor. It is my present opinion that the infection takes place generally from the cut end of the ureter and by lymphatic channels, and that this source of infection, which was pointed out by Stewart and Swett, has been too little taken into consideration. I am interested in Dr. Coffey's conclusion based on his communication from C. H. Mayo to the effect that infection of the kidneys has not taken place in the cases in which his method was applied. In consideration of the great difficulty of drawing conclusions as to the integrity of the kidney in cases in which the urine is secreted into the bowel, and the well-known fact that extensive kidney infection may occur and exist without producing symptoms, one may be pardoned for being unwilling to accept this evidence as conclusive. We know that important grades of pyelonephritis may show their presence only by a slight trace of albumin in the urine and a persistent bacilluria. We are not furnished with evidence sufficient to warrant the opinion that these kidneys have remained free from infection.

Dr. George Lee Eaton, San Francisco: Mention has been made of the transplantation of the ureter into the appendix. I would like to make a statement in regard to the transplantation of the right ureter into the appendix which was reported to the San Francisco Urological Society some four years ago. I performed the operation of transplanting the ureter into the appendix, as it was impossible to transplant into the bladder, which was injured during a former operation. Up to four months ago the patient has shown no ill effects due to ascending infection, and to prove the kidney is functionating, the least diuretic in the way of water causes an immediate purgation.

Dr. W. F. Braasch, Rochester, Minn.: Dr. Barber deserves a great deal of credit for the work he has done in demonstrating certain facts concerning the physiology of the ureter. The outcome of the operation for ureteral transplantation depends, largely, on whether or not the kidney becomes infected. Renal infection will usually be the direct result of obstruction in the urinary drainage. If drainage from the kidney is obstructed, infection will follow. The degree of natural resistance will also be a factor in overcoming a slight interference with drainage. I believe that the success of Dr. Coffey's operation is due to the fact that the urinary drainage has not been interfered with. In regard to Dr. Cabot's paper, it is unfortunate that he has confused the consideration of stone in the kidney with that of stone in the ureter, since they may have widely different symptoms and pathology.

In regard to the number of stones found on either side, I believe that in a large series of cases it will be found practically equal. As far as the proportion of occurrence in the male and female is concerned, it is undoubtedly true that urinary lithiasis occurs much more frequently in the male. The same is true with the various forms of renal infection. I am under the impression that the similar relative proportion in lithiasis and renal infection is corroboratory of the fact that a like etiologic factor exists in both conditions.

Dr. Hiram R. Loux, Philadelphia: I was much gratified to hear the report of Dr. Coffey. It has an important bearing on the momentous question pertaining to conservatism in surgery. I believe that frequently one may save a kidney, whereas it is possible to sacrifice it unnecessarily. After the discussion this afternoon, and the reports of these cases, and the methods of transplantation, I think the tendency of this meeting is toward transplantation. I believe, however, that as Dr. Braasch just stated, it is a question of resistance added to the question of infection of the ureter as to whether the recovery is complete or whether we have an early infection higher up.

Dr. W. Howard Barber, New York: This brief paper on anastomosis has simply been a surgical study of the transplanting of the ureter physiologically. We all enjoyed Dr. Coffey's excellent description of his operation. It is interesting that Dr. Coffey secured better results when he made his anastomosis somewhat oblique after the manner suggested by the common bile duct entrance.

Last summer Dr. Braasch, at Atlantic City, commented on the care with which the Coffey operation was done, and contended that in that way the neuromuscular control of the ureter had been preserved. The importance of the neuromuscular apparatus of the ureter was brought out then by us and finds present agreement in the remarks of Drs. Cabot and Draper.

Dr. A. J. Crowell, Charlotte, N. C.: What percentage of stone formations in your series have returned, and what percentage followed with infection which caused you to claim they are not well?

Dr. Cabot: Of this 49 per cent., how many of them had stones and how many of them had other things?

Dr. Crowell: Yes.

Dr. Cabot: I could not be particularly accurate on that, because the report had to be based on the finding of shadows. The plates showed shadows which we believed to be due to stone, but we do not know they were due to stone. These were cases recently collected for investigation and none of the patients has been operated on.

In reply to Dr. Krotoszyner I will say that many of them were not examined immediately after an attack, for the reason that patients will not have an attack when you want them to. They come to the hospital and you keep them there, put them under a variety of conditions of diet and exercise, and yet they will not have an attack. Send them home and they will at once have one, especially if they live at a great distance. We cannot examine them always in the immediate period of an attack.

In regard to Dr. Braasch's discussion, I am entirely willing to accept his criticism. This would have been a more valuable study had it been divided, but it was not possible to do so. A good many of them were cases of both stone in the kidney and the ureter.

I am not at all in accord with the view expressed by Dr. Braasch in regard to the greater frequency of infection in the male than in the female. I believe that precisely the opposite is true, that renal infection is much more common in the female, but of lesser degree and severity. In the female child the occurrence of pyelonephritis, as compared with the male child, is ten to one. Take the frequency of pyelonephritis in cases of first pregnancy, and the number is very large in my part of the country. We have a large number of cases in women, much larger than at the same age in men. Many of these cases are comparatively transitory, and many of the women have comparatively little trouble for many years. I am not at all prepared to believe that infection of the kidney is more common in the male. I do not believe that infection is an important cause of stone formation. I am inclined to regard renal obstruction of some type as a very important factor.

Improvers of the Race.—There has been an increasing interest in the question of the improvement of the race during recent years. Unfortunately, discussion of the matter has not remained in the hands of competent persons, but pretty much every one who has a babbling tongue or who can scribble, and who either feels it his mission to remake the world, or who has discovered how easy it is to become famous via the cheap magazines, has taken part. Psychology and psychiatry are subjects that have a curious attraction for the eccentric, the borderland insane, the half educated, and the emotional, and as many people of these types have a ready tongue and pen, a great deal of harmful as well as harmless silly stuff has been printed. We in this country suffer more than some other parts of the world from self-appointed improvers of the machinery of the universe, because every man's opinion is as good as another's in a democracy, and . . . because the political and scientific paranoiacs, who seize every opportunity to be in the front of every popular movement, and sometimes for a time succeed, always have a large following.—Charles W. Burr, M.D.

FRACTURES

NEW IDEAS AND NEW INSTRUMENTS*

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It is fortunate that a paper on new surgical treatment of fractures does not imply that all fractures shall be treated by open surgical methods. However, it does imply correctly that neither the closed nor open methods are as efficient as they should be. Within a short time the entire subject of closed treatment will have to be rewritten on a selection of entirely different basic mechanical principles.

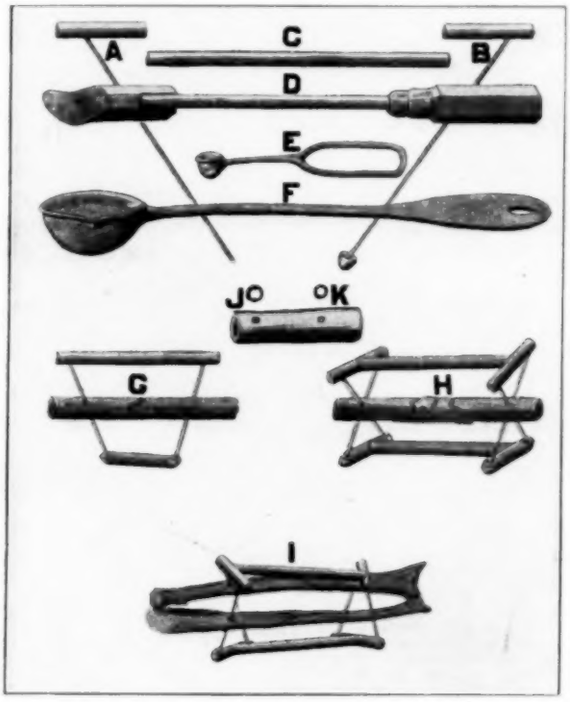

Fig. 1.—*A, B,* bone pins with low melting alloy handles (160 F.). The drill point on *B* has cast on it an alloy button used to couple it with another drill point. *C,* a bar of low melting alloy for joining drill handles in case they are not long enough to reach each other without such extensions. *E,* ladle for casting alloy buttons on points of drills. *F,* a large ladle for melting alloy over flame or in hot water. *J, K,* different shaped holes, *J* due to reciprocating movement of flat drill, *K* due to continuous rotation of any form of drill. *G,* diagrammatic scheme for holding fragments of broken bones in accurate reduction. The two pins do not lie in the same plane. Each represents a scheme for holding fractured ends by using constant normal distance rods. *I,* fracture of radius and ulna. Note the process of preserving normal length and proper separation of fragments. No rotation, angularity or overriding is permissible under this system.

The conventional methods still in practice, since the days of Columbus, when the world was flat, depend on most excellent mechanical principles. These principles, sound and unalterable as they are, happen to be absolutely inappropriate for the mission expected of them. Their absolute soundness does not guarantee their appropriateness any more than the unsoundness of ancient argument guaranteed for us a flat earth. Man alone is responsible for the misuse of judgment in selecting inappropriate ways and means.

In new open surgical treatment it is naturally consistent to find a composite mixture of modern sparkling ingenuity within the calcified shroud of St. Christopher. Surgical ingenuity is not efficient because of ingenuity alone. It must be coupled with additional qualities in order to be sufficient. A Lane plate for instance, involves a trace of ingenuity; but, in my opinion, to leave a foreign body permanently embedded in a wound borders on bad surgery, whether that permanent foreign body be a pair of forceps or a pair of spectacles or a bunch of screws, loose or penetrating the holes of a steel plate. To leave a foreign body permanently embedded in a wound is at least an unnecessary procedure.

Up to the present time we have seen outside and inside bone splints of various kinds. Those outside remain dry, those inside wet, of course. Now comes a new variety of amphibious appliances existing both inside and outside at the same time. There are several varieties. A few will illustrate the generic qualities of all. They are protruding nails elevating, depressing and anchoring cleats, protruding wire loops thrown around bone and secured to an outside straight edge, and, lastly, the bone gimlet with its low melting alloy handle. All of these devices are amphibious, that is, they extend from bone out through soft tissues into the open air. They are all silver or silver plated, with polished smooth sides. After union occurs, they have served their purpose and are removed without secondary surgical operation. They do not remain as permanent foreign bodies. To install them, the length of incision and the amount of dissection about the bone is greatly reduced. They do not come in contact with the fracture zone. They do not compress periosteum

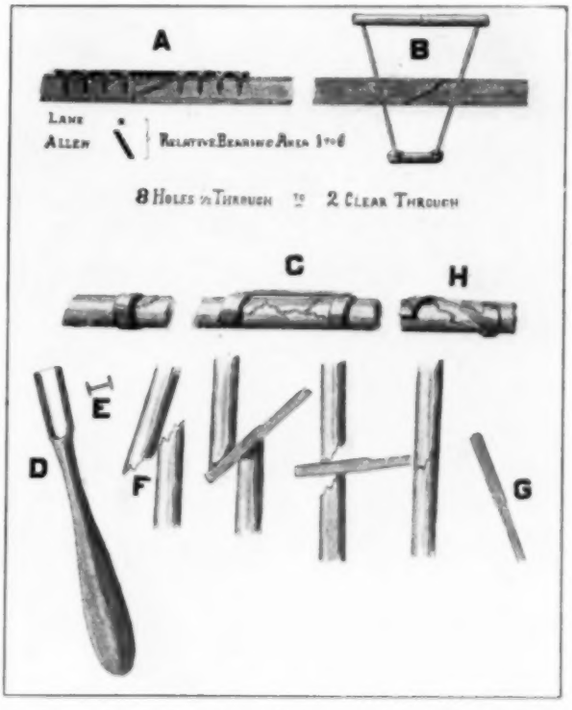

Fig. 2.—*A,* Lane plate with eight screws all parallel; only one-sixth of their entire length traverses hard bone. The portion within the canal of the bone is hopelessly without function. *B,* Allen system, providing long, hard, bony bearings and providing outside control over inside conditions. *C,* bone cleats welded cold on bone. *H,* metal welded on ordinary calling cards without burning the cards. *D,* Allen's bone-adjusting lever. *E,* cross-section showing the I-beam features which prevent bone fragments from slipping laterally. *F* to *G,* methods of using lever in overriding bone displacement.

* Read before the Section on Orthopedic Surgery at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

or bridge across fractured areas. They are applied remote from the fracture zone unless desired to traverse it. They are not inadjustable, but at all times provide excellent outside control over inside conditions, and up to the present time, no case of infection can be attributed to them, although in my hands and in the hands of others, they have passed through external pus areas without producing deep or internal infection.

To say that children and patients of all ages do not suffer or complain while wearing these transfixing or protruding devices would at first suggest straining a point in veracity; but, on second thought, you may correctly compare these devices to deep sutures. If your patients do not complain of pain from their deep sutures, they will not complain from these protruding devices, because, at the time of their application, all soft tissue strain is relieved by overstretching or by insignificant incision. Furthermore, a suture has a compression and constriction element, which is here absent. From the foregoing suggestions and other good reasons and from my past and from your future experience, I have dared to make the statement that this method is comparatively free from pain.

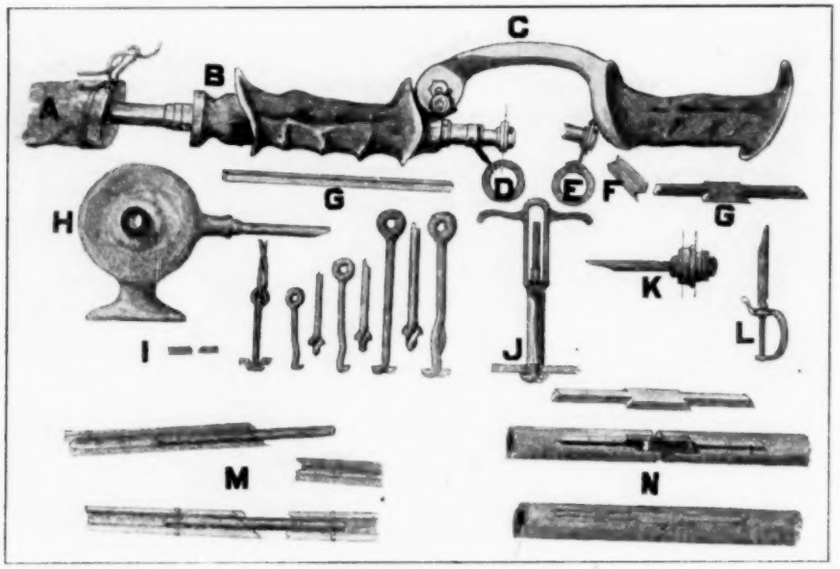

Fig. 3.—*A, B, C, D,* Allen's bone saw assembled in the process of cutting a wedge-shaped bone graft by one of its two methods. *A,* sterile sleeve to cover driving cable from motor to saw. This saw may be driven by any motor desired; hand-driven motors are by no means to be overlooked, as they will work regardless of electrical conditions. *B,* junction of driving cable from motor to this draw-knife or spoke shave type of saw. *C,* movable or lockable left handle. *D,* wedge-shaped cutting device assembled. *E, F,* different devices for cutting wedges. *H,* dowel pin cutter. *I* to *J,* elevation and depression tools with their countersinking shouldered drills. *K,* adjustable double saw. *L,* routing tool attachable to saw. *M,* telescopic bone grafting scheme. *N,* double wedging automatic locking bone graft.

While waiting for the first case of infection, it may be well to recall that, of all safe drainage material, nothing surpasses silver, and of all known methods of drainage, none excels through-and-through drainage. The combination of through-and-through silver drainage may play a very important part in the absence of infection.

The use of protruding nails, cleats, etc., and wire loops secured to outside straight edges is self-evident after a moment's observation of the illustrations, Figures 4, 5 and 6. My practice with the wire loops is to use soft steel wire silver plated. The loop passing around the bone should never constrict the bone or the periosteum. It should have as near 180 degrees bearing on the bone as possible. As it enters the skin it approaches the bone at a tangent, passes 180 degrees around the bone, and then leaves as a tangent out through the soft tissues and skin to its outside straight edge attachment. In case more bearing is essential, at least 60 degrees of unrestricted circumference should be provided. In this event the wires must be twisted five times on each other to the right. Then in order to remove them, after bone union occurs, they are to be untwisted five times to the left, and the loop pulled out. (Fig. 5 *A, B, C, D, E, F*). In employing silver plated wire nails, one should be sure to use very long thin "finishing nails." The heads protrude far enough so that a good hold may be taken on them with extracting forceps, as they sometimes become tightly *embedded*. (Fig. 4 *B*).

The flat silver plated drills with their alloy handles may be used with or without an exploratory incision over the zone of fracture. Usually, I make the incision in order to secure an absolute and accurate reduction, and I should announce here that absolutely accurate maintenance of reduction is possible with this system of treatment. The bones are brought into absolute reduction, the bone adjusting lever being used if necessary. (Fig. 2 *D, E, F, G.*) The exploratory incision provides digital and ocular inspection. The bone pins are passed through the bone an inch or so on both sides of the fracture zone. While the reduction is held absolute and accurate, the low melting handles are brought into line, touched with the soldering iron and the ends are fused together. The operator releases his hold on the bones, and they remain locked in absolute reduction as if by magic. An alloy button is then cast on the end of each drill, and a segment of the alloy fused to each button, thus affording additional stability in locking the broken ends tight together. The exploratory wound is sutured, and a wet antiseptic dressing is applied over it and around the projection of each transfixing pin. It must be remembered that no two pins should lie in the same plane. It is difficult to put them parallel and in the same plane. Fortunately, the easy unparallel way is the correct way, and the more the drills depart from parallelism, the more secure this system becomes. If a carpenter desires to make a studding stand erect on a floor he does not drive all of his nails parallel or in parallel planes. He "staggers" or "toe nails" the nails into place, and the studding "stays put." A Lane plate and all similar devices depend on parallelism of screws. (Fig. 2 *A, B*). Furthermore, the screws have only from $\frac{1}{16}$ to $\frac{3}{16}$ inch bearing for their threads. The long end of the screw projects into the bone canal or fragile cancellous tissue, and is totally and absolutely devoid of function. The transfixing pins have bearings in both layers of hard bone, which are

more remote from each other than the diameter of the bone. This is due to the fact that the drills pass obliquely through the bones.

Every man who has bored round holes in bones for wires or screws or nails knows from his roentgenograms and secondary operations that in about a fortnight these round holes have become oval or egg shaped. With a Lane plate there is no chance to take up the slack. With the transfixing pins one has absolute outside control over inside conditions and can take up as much slack or correct as much rotation as desired without a secondary surgical operation. One merely melts or cuts the handles apart on one side, separates or rotates them as one likes, and then fills in the gap between the handles with a drop or more of the low melting alloy. When the Roentgen ray shows bone union, one is at liberty to melt the alloy off of both ends of the drill rods, paint the rods with iodin, and allow them to dry thoroughly, when they will be easily pulled through the holes originally made. These holes, it must be remembered, form a free working hole through both hard and soft tissues. Gentle traction with the fingers is sufficient to extract them. The alloy melts at about 160 F., so that warm water will melt it; or if one is in a hurry, the knife-bladed soldering iron may be used. (Fig. 1 *D*.) Twist drills and continuous rotation with flat drills should not be used; they should be sent through the bones with a reciprocating movement passing through a working arc of about 165 degrees and not through as much as 180 degrees (Fig. 1 *J, K*). In this way two things happen: the nerves and blood vessels are pushed aside, and the hole through the bone is not a complete circle, but has a pair of internal opposed bone ridges which guarantee a tight fit against the drill shaft as shown in the illustration. A twist drill with its uninterrupted rotation not only drills a round hole, but also will wind up and extract loose soft tissues on itself.

Concerning bone grafts, I desire to present two methods. One is known as the telescopic bone graft and the other as double opposed wedge graft, which automatically locks itself and the fractured bones together (Fig. 3 *M, N*).

If a portion of a shaft of a long bone is absent, the gap may be bridged as follows: A deep canal or tunnel is drilled into the axis of the longer fragment, and a shorter canal into the shorter fragment; a long dowel pin is turned up to fit the bored canal, the dowel pin slipped down into the long canal, the two canals brought into line and the dowel pin worked toward and well into the short canal (Fig. 3 *M*). The short end is pinned with a transverse bone pin, and then when the broken bone is pulled to its normal length, the long telescoped end is secured with another transverse bone pin as shown in Figure 3 *M*. If desired, the dowel pin need not be circular, but may have a flat side with periosteum still intact. The ends of the periosteum may be stripped up and put in contact with the periosteum at each end of the fracture.

Another interesting bone graft is the double opposed wedge graft. It involves the use of a wedge-cutting saw, like the one presented, which has two different ways of cutting wedges, as shown in Figure 3 *A, B, C, D, E, F, G*. The male wedge and the female, or the positive and negative wedges, must be accurately cut. The ends of the wedges are cut with opposing wedges or bevels. The broken bone is pulled far enough apart to let the wedge drop into place (Fig. 3 *N*). The traction is then released, the soft parts drag the bone fragments tight into place, and by the double opposed keystone or opposed wedges the bones are locked in place, requiring no bone pins to hold them together. Before attempting this operation, one must become adept in accurate bone cutting. In this form of graft the periosteum may be left intact throughout the entire length and breadth of the graft.

The last method of bone cleating may have some novel features of unusual interest. It consists of a process of welding any desired metal on a bone in the form of a cleat or key or wedge or "C" clamp or any pattern desired. The metal to be used is atomized and the minute particles of metal are impelled against the recipient area until they are welded cold on each other to any desired thickness. The specimens presented to you show the bone is not burned. The periosteum of one bone is still intact, although it is scraped away from the other bone. The pasteboard calling card has metal welded on it, although the card is not burned (Fig. 2 *H*). Around one of the bones a German silver band is welded; about the other is a band first of steel, then copper and then brass; then on this practically any other metal may be welded on cold. Interesting as this may be, I cannot recommend its use, because any foreign body permanently left in a wound is, I believe, not only unnecessary but borders very closely on bad surgery.

Concerning the splints used in connection with all of these new methods, I cannot refrain from making an appealing request. Please use wire and adhesive

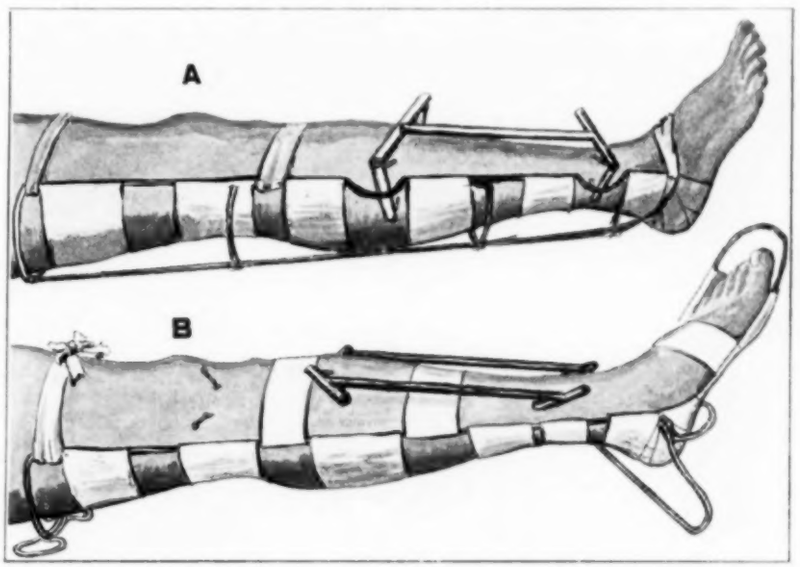

Fig. 4.—*A*, wire and adhesive plaster brace used in connection with bone pins and constant distance rods in treating a shattered tibia and fibula. *B*, use of protruding nails in securing broken off portion of the tibial head; also constant distance rods and bone pins with low melting alloy handles. Note that the wire brace among other duties keeps the bed clothes from resting on the foot and also prevents the leg from rolling.

plaster braces or splints. They are simple, light, strong, sanitary, cheap, durable, adjustable and betray the first requisite of new fracture work. If a man is not mechanic enough to make these little things, he is unfit to attempt accurate fracture work. When you go home buy some tinned steel wire and practice making them. They do not hide the work you should be proud of, but leave it always open for free examination and inspection. You can treat other conditions aside from fractures with wire and adhesive plaster appliances. They are appropriate to many deformities and make excellent framework over which gauze may be stretched in employing open air treatment. The gauze is kept from the wound or lesion and the gauze is a filter against dust. When you learn to use them, no one can lead you back to plaster of Paris. In the new treatment of fractures I most certainly include these new wire braces among the new ideas and new instruments.

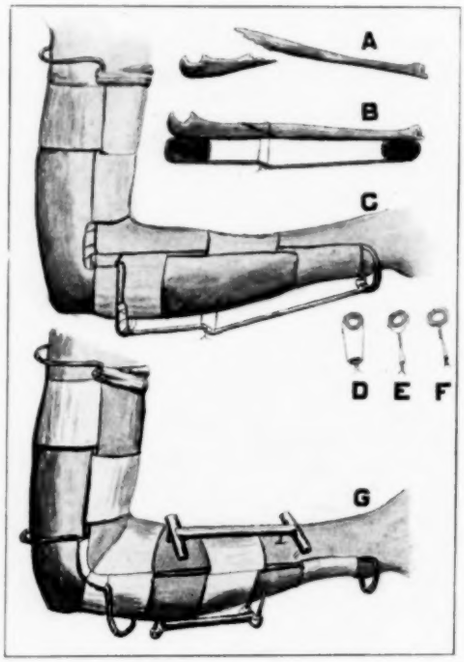

Fig. 5.—*C*, wire and adhesive plaster braces used in connection with the wire loop method of treating fractures. *A*, *B*, conditions of fracture and the three lever points essential to fixation. *G*, wire brace and bone pins employed in fracture of both radius and ulna.

ABSTRACT OF DISCUSSION

Dr. P. C. H. Pahl, Los Angeles: I read an article by Steinman in which he said he produced traction on the tibia, fibula and I think also the femur by means of nails passed through the bones. It has occurred to me many times that there were cases of fracture of both tibia and fibula and of the femur in which it was very difficult to produce traction by the means of adhesive plaster. Sometimes the adhesive plaster irritates, and sometimes the tissues are lacerated. When there are many fragments, bone grafts and Lane plates are out of the question; traction then is the only thing, and in order to gain this I have made what I have called a spine tractor—two thorns that go into the bone through little incisions, and then traction is applied. I have done this in twenty-one cases. I am very sorry to say that two of the patients subsequently died, although I did not personally have absolute control over them. It is possible to produce traction, and I have produced as much as 65 pounds in the beginning and gradually reduced this to twenty-five pounds, the treatment lasting for two months and a half. I did this in a Mexican who had a fractured femur, in the upper end, in which there were five fragments. Personally, I have not had the experience which warrants cutting down to the bone on a man who has five fragments in his femur. In this case I put the spines into the condyle of the femur, making the traction vertical, with the leg flexed. I have never been able to make traction vertical with the knee extended, but with the knee bent, it is possible to do so. The first traction was so much that the patient was lifted up in bed, and, of course, there was much lack of apposition, but finally the fragments came into proper position, and the man got a functional leg. What Dr. Allen says about positive fixation has also occurred to me. I have an instrument which I call a "multiple spine splint." I made one for the tibia. I place two spines on the lower end and two on the upper end of the fibula and tibia. I make, if necessary, a small incision over the fracture, reduce the fracture, and then tighten these four spines, or two sets of spines, which really make a bone vise. These cases were all satisfactory. I must say, however, that prejudice against them is very great, and in a municipal hospital where there are many men, it is almost impossible to use them.

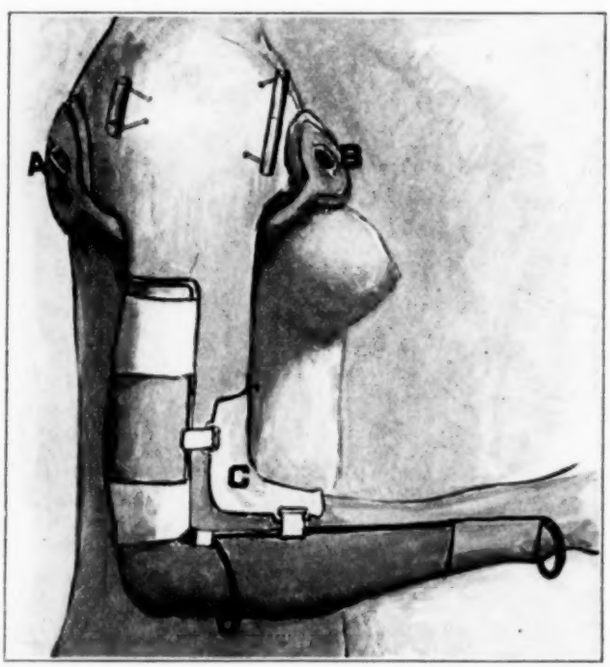

Fig. 6.—Brace and bone pins for fracture of head of the humerus. The pins prevent rotation of the fractured head on shaft. Absolute and accurate maintenance of reduction is possible by this method. The crutch under the arm and the anterior elbow plate provide fixed points for the application of fixation forces. In case the axilla is burned or from other causes cannot be used for superior fixation point, adhesive bandages upon the back, abdomen and side attached to loops *A* and *B* constitute a stable superior fixation base which may be depended on.

Dr. H. M. Sherman, San Francisco: I was much impressed with one statement which Dr. Allen made, and that was the fact that he never got infection. Now a long time ago I began to nail the neck of the femur in fractures of that part of the skeleton, and it always became infected if the nail head was on the surface. Longer ago than that, Parkhill devised this scheme of fastening bones, but all the openings which passed through the skin became infected. The Lambotte scheme, and all the variations and modifications of that, where a drill point or a nail goes through the skin and then into the deeper tissues and remains there, always call for infection. We are now making what we call skeleton traction by a pin through the femur, instead of a Buck's apparatus, and it is a method by which we always get local infection. Dr. Allen says he puts those bits of wire pegs through an infected area into the deeper parts, and never gets an infection. I want him to tell us how he avoids infection, because if he will tell us that, he will put into our hands not only his own apparatus, ingenious as it may be, but he will give us the most important piece of information in his possession—one for which

surgery is anxiously waiting—and we will all begin to look around for mechanical ideas and will be able to take care of fractures as easily as he.

Dr. Allen cites the fact, which is perfectly well known, that a screw in a bone bearing weight always causes a necrosis of the part of the bone against which it is pressing so that the holes become oval; and they become even more than that; they become quite large places. I put two screws in a dog's bone, setting them in the bone very firmly, about an inch apart, and then put a little elastic band around them and sutured the wound. The wound healed and in about a month I opened it and found that both of those screws had been pulled out of the bone by that little elastic. The pull of a little piece of india rubber was sufficient to make a round hole oval, and then to pull the screw out of this oval hole. Does not Dr. Allen get the same kind of pressure, absolutely, with the wire pegs which he puts through the bones, so that we can expect the same results under these circumstances? These are things I should very much like to have Dr. Allen explain to us.

DR. H. R. ALLEN, Indianapolis: Dr. Pahl suggests the inadvisability of cutting down on a femur fractured in five places. Such a case should be treated by the application of fixation forces for fixation purposes. If any fragment remained uncontrollable under the closed method it could be cut down on and treated by the open application of fixation forces for fixation purposes. We must not delude ourselves by thinking that the irregular muscle force is in any sense a balance or counterpart of a constant force. The application of a constant force through a weight and pulley implies motion of parts desired to be kept quiet and fixed. The application for fixation forces implied absence of motion and the presence of fixation. To oppose the constant force of gravity by the irregular force of muscle necessarily leaves a plus or minus balance of force resulting in motion. Fixation forces are not concerned with motion. Dr. Sherman presents two good points: one refers to the application of a rubber band and the other to the possibilities of infection. A rubber band, of course, while inactive is inert, but during activity it represents a constant force and must be dealt with according to its own generic qualities of constancy. Concerning infection, or rather the absence of it, I am inclined to believe that my good fortune in this regard has been influenced possibly by the technic employed. The operation field should be scrubbed with soap and water, rinsed with mercuric chlorid solution, then washed with alcohol and painted with iodin, which is removed with ether. Every instrument, in fact everything, is wet with mercury solution while it is near or in contact with the wound. Each wound is thoroughly irrigated with mercuric chlorid solution, and after suturing with mercuric chlorid soaked silk a wet mercuric chlorid dressing is applied and maintained as a permanent dressing. I believe in the use of mercuric chlorid. I also believe in through and through silver drainage.

What Is Good Literature?—Unless an author takes the material on which he writes out of his own head, that is to say, from his own observation, he is not worth reading.—Schopenhauer.

I. A NEW METHOD OF PASSING THE WAX TIP

II. MODIFICATION OF THE TECHNIC OF PASSING THE WAX TIP*

BEN R. KIRKENDALL, M.D.

COLUMBUS, OHIO

I. A NEW METHOD OF PASSING THE WAX TIP

In 1894, Howard A. Kelly introduced the wax tip catheter method of diagnosis of ureteral calculi in the female through the open cystoscope. Since then many other observers have attested its value:

First, the wax tip will diagnose ureteral calculi unaided. Second, in conjunction with roentgenoscopy, it will rule out or make positive a shadow in the line of the ureter.

Third, it will diagnose ureteral calculi which have been entirely missed by the Roentgen rays.

Fourth, the gynecologists for several years have been able to locate the site of ureteral calculi by passing a ureteral catheter, with a series of wax bulbs, through the open cystoscope.

Three years ago, Burton Harris devised a method for the use of the wax tip with the male catheterizing cystoscope by passing the wax tip into a filled bladder and threading the cystoscope containing its catheterizing barrel onto the catheter, through the urethra into the bladder.

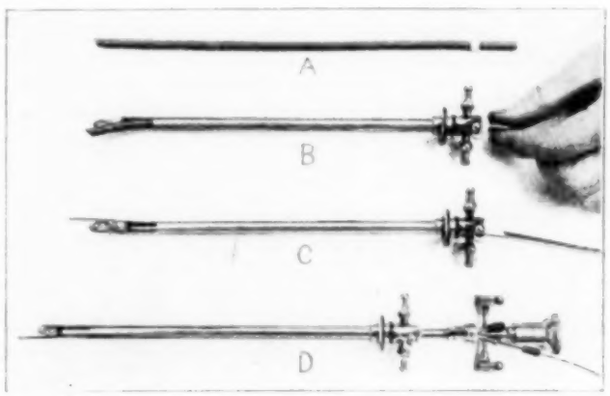

Fig. 1.—*A*. The rubber catheter with distal end cut on an angle of 90 degrees to allow its easy escape from the fenestra of the cystoscope. *B*. Rubber sheath introduced into the outer sheath of the cystoscope and rotated between the fingers to allow its escape from the fenestra. *C*. Wax tip bougie or catheter which has been introduced into the instrument through the protective rubber sheath and held in position while this sheath has been pulled out from around it. *D*. Threading the catheterizing barrel onto the wax tip catheter.

This procedure excites more pain and produces more trauma than an ordinary cystoscopy by the increased dilatation of the urethra and the liability of the open fenestra of the instrument to scrape or tear the mucous membrane. It requires a separate instrumentation for the introduction of the wax tip, and also requires the removal of the cystoscope before the wax tip can be withdrawn for examination.

A much simpler method with more possibilities is proposed as follows: An ordinary catheterizing cystoscope is used. The lumen of the outer sheath is lined with a loose fitting rubber tube to protect the wax tip in its passage into and out of the bladder. The tube is made from a soft rubber catheter, about a 16 or 18 F. The eye end of the catheter is cut off on a slant or angle of about 90 degrees. On this slant-cut end depends the ease of the following manipulations. The catheter, this end first, is passed into the cystoscopic sheath and out through its fenestra to the beak of the instrument.

The other end of the catheter is cut off an inch from the proximal end of the cystoscope, and it is allowed to protrude for a finger hold.

* From the James Brady Urological Institute, Johns Hopkins Hospital, Baltimore.

The Instrumentation: With the outer sheath of the cystoscope in place in the bladder, the protective tube is introduced and passed down to its distal end. The rubber tube being turned one or both ways between the fingers, its diagonal cut end will allow it to escape easily through the fenestra of the instrument into the bladder. It is held in place with the fingers on one hand, and the wax tip catheter is passed through this rubber sheath a sufficient distance to insure its tip being in the bladder. The catheter is held with one hand in this position while the other hand pulls the rubber sheath from around it. The

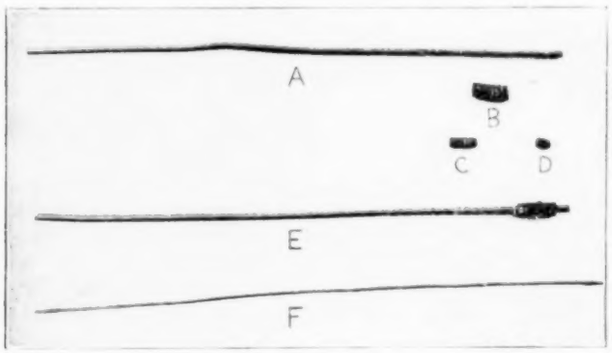

Fig. 2.—*A*. The rubber protective sheath for the operating cystoscope. *B*. The sleeve for the rubber protective sheath made from a piece of rubber tubing. *C*. An ordinary ureteral catheter tip or sleeve. *D*. Ureteral catheteral sleeve cut in half. *E*. The rubber protective sheath with its sleeve in place. *F*. The wax tip bougie with one wax tip and six wax bulbs.

catheterizing barrel is now threaded onto the wax tip catheter and introduced into the cystoscope. Enough fluid will remain in the bladder to protect the wax tip. If the foot of the table is kept elevated throughout the procedure, more fluid will remain in the bladder. With the catheterizing barrel in place, the bladder fluid is now increased and the wax tip passed up the ureter. The wax tip catheter may now be removed for examination without removal of the cystoscope, by reversal of the foregoing procedure, that is, only the catheterizing barrel of the cystoscope is removed. The protective rubber sheath is reinserted by being threaded onto the wax tip catheter, and it is rotated between the fingers until it again passes out into the bladder. It is held in this position, and the wax tip catheter is gently withdrawn from the ureter and out through the rubber sheath.

Control wax tips may be passed in the same manner, both ureters may be searched for calculi at the same instrumentation, and the whole procedure can follow a ureteral catheterization, and function test, with the one introduction of the cystoscope.

If the wax tip proves to be too large to pass through the ureteral orifice, or too small to be adequate, it may readily be withdrawn and increased or diminished in size and then introduced.

II. A MODIFICATION OF THE TECHNIC OF PASSING THE WAX TIP

The presence and the accurate determination of the exact location of a ureteral calculus can be easily determined by passing a bougie, equipped with multiple wax tips or bulbs, through an operating cystoscope supplied with a catheter tube to prevent marring of the wax by the instrument. For several months I have used, with complete success, a rubber catheter sheath for the passing of wax tips in a manner similar to that described by Hinman.[1]

Instead of using a bougie or catheter with a single wax tip, it has been found to be equally practical and of far greater advantage to use a bougie equipped with a wax tip and a series of from four to six wax bulbs placed about 2 inches apart, beginning about 2 inches from the wax tip and approximately covering 12 inches of the bougie — the normal length of the ureter.

A No. 3 ureteral bougie (preferably one impregnated with bismuth, as it is very durable) is used, but a small ureteral catheter will answer equally well. The wax tip and bulbs can be easily made by dropping the wax from a heated glass rod onto the desired point along the bougie. If the rapid rolling of the bougie between the fingers does not mold the wax symmetrically, holding the point high above a flame will remelt it and allow it to be remolded.

A soft rubber catheter, 10 or 12 F., is selected to make the protective tube. It must pass easily through the cystoscope used, and be of sufficient length to protrude from one-half to three-fourths inch from the proximal end of the instrument after its distal end has passed slightly beyond the elevator. A piece of small rubber tubing three-fourths inch long is used for a tip or sleeve for the catheter sheath over which it is slipped. Its proximal end is made water-tight around the catheter by several turns of a rubber band. Enough of the catheter to hold an ordinary ureteral catheter sleeve is left projecting.

The rubber tubing sleeve is best left in situ on the catheter sheath for convenience during the introduction of the sheath into the barrel after the cystoscope has been introduced into the bladder, as in the usual cystoscopy. The elevator is slightly raised to prevent a marring of the wax-prepared bougie, which is now introduced into the rubber sheath and is capped with a catheter sleeve which has been shortened about half.

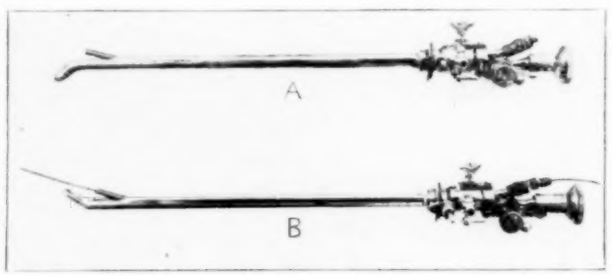

Fig. 3.—*A*. The cystoscope equipped with its rubber protective sheath. *B*. Introduction of the wax tip bougie equipped with a wax tip and several bulbs. One tip and one bulb show at the distal end of the cystoscope.

It is well to have this tip removed before introducing the bougie, to facilitate the passage of the wax bulbs.

As in an ordinary ureteral catheterization, the bougie is now passed up the ureter as far as the renal pelvis, if possible. The bougie alone is now gently withdrawn from the instrument and examined for scratches. Care should be taken to observe that the catheter sheath covers the elevator throughout the procedure. The handle of the cystoscope is best kept elevated during the bougie's passage up and down the ureter. This brings the distal end of the rubber

1. Hinman, Frank: A Practical Method of Applying the Wax-Tipped Catheter in the Diagnosis of Ureteral Stone in the Male, THE JOURNAL A. M. A., June 26, 1915, p. 2129.

sheath close to the ureteral orifice, and obviates raising the elevator to a greater angle, which would decrease the lumen of the catheter sheath. The small catheter sleeve is removed before the wax bulbs appear outside the instrument. Control wax-prepared bougies may be passed if deemed advisable.

On examination of the prepared bougie after its passage, it is obvious that if there is a scratch on the No. 1 wax tip and none on any of the bulbs, the calculus must lie in or near the renal pelvis. Likewise if all of the wax bulbs are scratched, the stone is within the ureter at or near its vesical orifice; while if some of the proximal bulbs escape the marring, the last one scratched locates the calculus at a corresponding point in the ureter.

This method is equally adaptable for use in the two sexes, and assures the accurate location of ureteral calculus without the aid of the Roentgen ray and will often diagnose calculi missed by it. The bougie being impenetrable to the Roentgen ray, a roentgenogram may be taken with it in place, if thought advisable. This will show the relation of the ureter to any suspicious extra-ureteral shadow.

137 East State Street.

LEUKEMIA—AN INFECTION?

WITH REPORT OF CASES *

RAY LYMAN WILBUR, M.D.

SAN FRANCISCO

Morphologic studies are so interesting and apparently definite that it is not surprising that there has been a tendency among medical men to spend an undue amount of time on this phase of the leukemias rather than on the more vital one of etiology.

The breaking down of the artificial borderlines of distinction between the leukemias, the leukemic changes in the blood in the presence of established infections,[1] and the variability in the findings in different patients and at different times in the same patient as shown by the report of many writers, notably Klieneberger,[2] Stein,[3] Marchet and Rieux,[4] Reschad and Schilling,[5] Moreschi,[6] Ghedini,[7] Strauch,[8] Morawitz,[9] Warren[10] and Paltauf,[11] have diverted attention more particularly of late to the cause of the leukemic process. We now hesitate to go much beyond the word "leukemia" or "leukemic state" in making a diagnosis, perhaps adding to it "lymphatic type," or "myelogenous type," as the case may be.

While the conception of leukemia as a neoplasm, fathered by Banti and others, is still extant mainly because of the tendency of enlarged glands during overgrowth to involve other structures, and the idea of Naegeli[12] that leukemia is a distinct entity rather than a neoplasm or infection has been welcomed by a few, the general trend of medical opinion seems to be more and more to regard the leukemic process as the result of an infection or a secondary toxicosis of particular parts of the body, primarily the bone marrow, spleen and lymphatic structures. This infection may be due to some one unknown organism, but present information makes it more probable that it can be caused by several different ones when the conditions are favorable. Chronicity of infection with low virulence, but with the liability to acute exacerbations, bone-marrow involvement, one infection preparing the soil for the next, are outstanding features of many of the published reports. Lymphocytosis as distinguished from leukemia has led to confusion, and borderlines are hard to draw. The recovery of patients with marked lymphocytosis or leukemia, as the case may be, has been reported by a number of observers, notably Cabot,[13] Jackson and Smith,[14] Türk,[15] and here in California we have had such patients under observation. Such high lymphocyte counts as those noted in typhoid (Herz,[16]), pneumonia and other ordinary infections (Steven,[17] Cabot,[13] Austrian,[18] Hirschfeld and Kothe[19]), and the leukemic blood changes following bone injury—fracture—and definite bone infection (Simon,[20] Herz,[16] Ward,[21] Stursberg[22]) are more than suggestive. Certainly too little attention has been given to the bone marrow as a nidus for all sorts of infection. The selective action for certain portions of bone marrow shown by the tubercle bacillus as brought out by Ely,[23] together with the lymphocytosis characteristic of that infection, is worthy of note.

Early investigators (Fraenkel, Ebstein) noted the striking resemblance of leukemias to infections, particularly the acute leukemias with fever, hemorrhages, skin lesions, splenic tumor and asthenia. Patients with the type dealt with by McCrae,[24] Lüdke,[25] Hirsch-

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* Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped, addressed envelope.

1. The explanation given by Döhrer and Pappenheim (Folia haemat., 1913, xvi, 145) that this is a special tendency to leukemia on the part of the blood-producing tissues, or a leukemoid reaction of the blood during sepsis ("einer besonderen leukämischen Prädisposition der hämopoetischen Gewebe," or "leukämoide Blutreaktion bei Sepsis") seems inadequate.

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3. Stein, B.: Zur Kenntnis der Aleukämien und zur Therapie leukämischer Erkrankungen, Med. Klin., 1915, xi, 246.

4. Marchet, A., and Rieux, J.: Un cas de leucémie aiguë du type myéloïde, Arch. d. mal. du coeur, 1913, vi, 574.

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18. Austrian, C. R.: Hyperleucocytosis of High Grade in Bronchopneumonia in a Child, Bull. Johns Hopkins Hosp., 1911, xxii, 298.

19. Hirschfeld, H., and Kothe, R.: Ueber abnorm hohe Leukocytose bei schweren Infektionen, Deutsch. med. Wchnschr., 1907, xxxiii, 1255.

20. Simon, C. E.: Leukemic Blood Picture in a Case of Fracture of the Ankle, Am. Jour. Med. Sc., 1907, cxxxiii, 390.

21. Ward, G. R.: Secondary or Symptomatic Leukaemia, Proc. Royal Soc. Med., 1914, vii, 126.

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23. Ely, L. W.: Joint Tuberculosis, New York Med. Jour., 1915, ci, 783.

24. McCrae, T.: Acute Leukaemia in Childhood, with Report of a Case, Bull. Johns Hopkins Hosp., 1900, xi, 102.

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feld and Dünner,[26] Beltz,[27] Strauch,[28] and Nanta and Loubet,[29] are hard to understand on any other basis. Animal (Lüdke[30]) and chicken leukemia (Ellermann,[31] Ellermann and Bang[32]), the passage of the latter through a series of animals, and the apparent leukemic change in the blood of the fowl after inoculation with that from a human leukemic patient (Wiczkowski[33]) have excited much interest. Other inoculation experiments (Sternberg,[34] Fraenkel and Hatluch[35]), the possible contagiousness of the disease as indicated by Obrastzow's patient, the familial character noted at times (Barrenscheen,[36]) and its occurrence in a baby a few days old with a right-sided endocarditis (Pollmann[37]), and the early leukocytosis observed in a number of cases, all indicate infection. Numerous organisms have been described as occurring in the blood or tissues, the seat of leukemic changes. Among these, streptococci have been reported a number of times (Nanta and Loubet,[29] Jochmann,[38] Ziegler and Jochmann,[39] W. Erb, Jr.,[40] Churchill,[41] Sternberg,[34] Gorjaew,[42] Marchet and Rieux,[43] Stursberg[22]) and also Auer's bodies (Much and Hegler,[44] E. Fraenkel and Hatluch[35] (quoted by Arndt), Ottenburg,[45] von Domarus[46]). Tubercle bacilli (Nanta[47]), corynebacterium (Steele,[48] Simon and Judd[49]), staphylococci (Herz[16]) and various mixed organisms (Lavenson[50]). Some of these may well be secondary and some, like corynebacterium, are probably common enough in various dead body tissues not to be of well-defined significance. Besides, the question of primary and secondary infection is a most confusing one in this connection (Ward,[21] Neutra[51]). The development of aleukemia in leukemia under the influence of intercurrent disease, pneumonia, diphtheria, etc., is as puzzling as the leukemic states noted in defininte sepsis. The relationship to the status lymphaticus has been considered of much importance (Barrenscheen,[36] Citron[52]) in determining the leukemic reaction to possible infection. Blood-forming tissues, when infected, react in peculiar and as yet imperfectly determined ways. Sternberg has called attention to the frequency of myelocytosis in the course of various infections. Intestinal infections (Oppenheim,[53] Peacock[54]), tonsillar foci (Gilbert and Weil[55]), and the selective action of certain infections for bone marrow present features requiring careful analysis and study.

In order to indicate some of the problems involved, and to emphasize that leukemia, although most variable, can readily be explained as due to an infection, the following three selected case histories are of interest:

CASE REPORTS

CASE 1.—*Acute leukemia.* (Medical Clinic, Stanford Medical School.) April 2, 1913, H. H., an American office boy, aged 17, complained of swelling of the glands of the neck and slight cough. The family history was excellent. General health had always been satisfactory except for measles, whooping cough and mumps. Patient had had frequent toothache with swelling, the last time a year ago. Three weeks and a half ago he had pain in the upper part of the chest and swelling in the lower part of the neck, and later enlargement of the glands under the jaw and in the right groin. He noticed that he would spit up a lot of mucus, but no blood, and that his face would be puffed up in the morning, but would go down during the day. The wrists also were slightly swollen and tender. He had had some early morning sweats.

The patient was a well-built and well-nourished boy of good color. Except for the enlarged glands noted in the history, some puffiness about the eyes, hypertrophy of the tonsils and the evident involvement of the upper mediastinum with enlarged glands, no abnormalities were noted.

The blood examinations were as follows:

	April 2, 1913	April 7, 1913
Hemoglobin	80%	90%
Red blood corpuscles	4,850,000	4,980,000
White blood corpuscles	8,800	8,900
Polymorphonuclears	41%	48%
Lymphocytes	54%	45%
Large mononuclears	—	5%
Eosinophils	1%	—
Basophils	4%	2%

(The lymphocytes were mostly large granular forms.)

April 8, 1913, patient was vaccinated because of previous exposure to smallpox.

April 10, a clinical diagnosis of lymphosarcoma was made, and a posterior cervical gland was removed for microscopic diagnosis. The sections showed moderate hyperplasia of lymphadenoid tissue, moderate increase in fibrous tissue which in places showed marked thickening and hyaline change. No evidence of tumor found. Chronic lymphadenitis (Dr. E. C. Dickson).

April 15, although patient seemed to feel well, the blood counts were as follows:

	April 15	April 18	April 19 (Differ. Count*)	April 28
White blood corpuscles	252,000	233,600		440,000
Polymorphonuclears	6%	—	5.5%	2%
Lymphocytes	94%	—	86.0%	97%
Large mononuclears				1%
Myelocytes (fully developed)			1.0%	
Lymphoidocytes			2.0%	
"Kern Schatten"			5.0%	
Eosinophils			0.5%	
Red blood corpuscles				3,925,000
Hemoglobin				66%

* The great majority of the lymphocytes were from 6 to 8 microns in diameter, but a few microlymphocytes were present, and a large number of macrolymphocytes.

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45. Ottenburg, R.: Observations on Acute Leucaemia, with Special Reference to Auer's Bodies, Am. Jour. Med. Sc., 1909, cxxxviii, 562.
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47. Nanta, A.: Le rôle de la tuberculose dan l'étiologie de la leucémia myeloide, Arch. d. mal. du coeur, 1913, vi, 38.
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49. Simon, C. E., and Judd, C. C. W.: Acute Lymphatic Leukemia: On the Occurrence of the Corynebacterium Lymphomatosis Granulomatosæ, THE JOURNAL A. M. A., May 15, 1915, p. 1630.
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Degenerative changes were present in a large number of the cells—vacuolization and karyokinesis.

A small percentage of the large nongranular cells classed by Pappenheim as lymphoidocytes were found.

No myeloblasts or intermediary myelocytes were found, and the fully developed myelocytes or propolymorphs found were probably due to secondary bone-marrow irritation. No nucleated reds were found. (Dr. T. Addis.)

The patient was given Fowler's solution and Roentgen-ray exposures.

May 3, patient began to bleed freely from the nose and throat, the blood coming from about the uvula and the tonsils. There was a dull pain noted in the region of the spleen. Liver and spleen were both found to be enlarged and sensitive. There was hemorrhagic ecchymosis about the left upper and lower eyelid. Petechiae were noted in the pharynx and about the tonsils. The glands in the neck were distinctly smaller in size. Patient was free from pain, but felt weak and sleepy. He gradually became more restless and sleepless. Temperature ranged between 97 and 100.6 F. After two days of a comatose condition, patient died, May 15.

May 6, blood count was as follows: white blood corpuscles, 514,000; polymorphonuclears, 2 per cent.; lymphocytes, 98 per cent.

The details of the necropsy record are not available, but a marked enlargement of the mediastinal lymph glands was found and typical leukemic changes elsewhere.

CASE 2.—*Acute leukemia.* (Stanford Medical Clinic; Lane Hospital.) C. F., Italian laborer, aged 38, was admitted March 3, 1915, complaining of weakness and loss of appetite. Family history unimportant. General health always good. Smallpox when 12 years of age. Never had cough or respiratory disturbance. Denied venereal infection. Drank wine with meals.

Three and one-half months ago (about Nov. 15, 1914), he began to feel weak and to lose appetite. Thought he had some fever, coughed a little, and noted small amount of blood in the sputum, and sweat considerably at night. About one month ago he consulted a doctor, who told him he had tuberculosis. Since that time cough had almost ceased, but weakness and loss of weight had continued. Had noticed increased thirst and urination. Four days ago he noted marked redness of right eyeball and surrounding tissues, occurring without trauma and without pain.

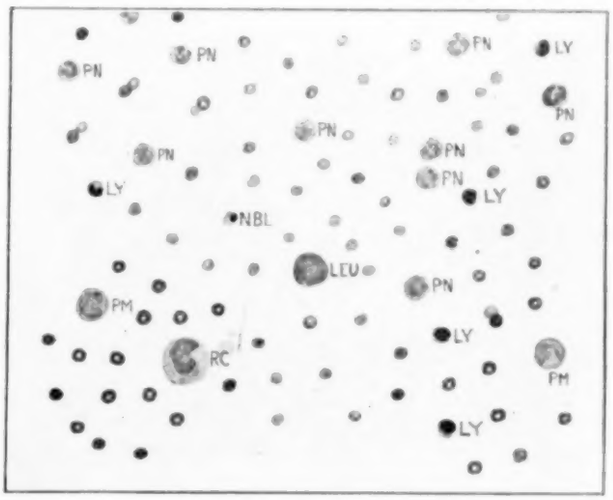

Fig. 1.—Blood, Case 3. Leukemia, myelogenous type, and anemia, pernicious type (?). *PN*, Polynuclear neutrophil; *LY*, lymphocyte; *LEU*, leukoblast; *RC*, Rieder cell; *PM*, promyelocyte; *NBL*, normoblast.

Examination on admission showed an emaciated man lying flat in bed, somewhat dyspneic. Color very pale. Marked visible pulsation of tortuous temporals. Extensive hemorrhage into right sclera and eyelids. Small ecchymoses in left sclera. Marked pulsation of carotids. Over right sternoclavicular joint was a small hard nodule, not tender, slightly movable. Percussion dulness over manubrium, extending slightly more to right than to left. Heart dulness increased slightly to right and left. Systolic murmur at apex, not transmitted. Slight abdominal rigidity. Spleen felt 5 cm. below costal margin. Slight pitting edema of ankles. Moderate enlargement of epitrochlears, axillary and inguinal nodes. Small areas of old hemorrhage scattered over skin of trunk. Temperature, 102.4 F.; pulse, 108.

Laboratory Reports.—Urine: Specific gravity, 1.015. Trace of albumin. No casts. Very few leukocytes and red cells. Blood: Red blood corpuscles, 1,123,000; white blood corpuscles, 199,600: 90 per cent. lymphocytes; 10 per cent. degenerated. Sputum: Small amount of blood. No tubercle bacilli. Stool: Occult blood present. Wassermann negative. Blood culture negative. Roentgenoscopy revealed enlarged mediastinal shadow and heart.

Course.—Temperature from 99 to 103 F. during first nine days. Fowler's solution, 5 minims, three times a day, was given. White count: March 4, 253,000; March 5, 117,000; March 7, 160,000; March 8, 81,000; March 10, 60,000. Hemorrhage into lids gradually cleared up, and that in sclera became much less. March 9, patient had hemorrhage from nose. March 10, 10 c.c. of wife's blood were given intravenously. Temperature fell to subnormal, and remained there until within a few hours of death, when it rose to 103.4 F.

Diagnosis.—Acute leukemia (lymphatic type); mediastinal glands especially involved.

Necropsy.—The principal items of interest in the necropsy, which was performed by Prof. William Ophüls, were as follows:

Smears and Cultures.—Smear of marrow of rib: Very many lymphocytic cells from two to three times diameter of red blood cells, many nucleated reds (normoblasts), moderate number of neutrophilic myelocytes, small amount of hematogenous pigment. No bacteria or other parasites found in deeply stained Giemsa specimen in spite of careful study with mechanical stage.

Smear of marrow vertebra.—Even fewer neutrophilic, eosinophilic and basophilic myelocytes. The rest of the cells have round nuclei of varying size, a very delicate finely granular protoplasm, the granules staining mostly blue with Giemsa, few of the very fine granules more reddish. Same cells but not quite so large in smear of rib.

Culture of mediastinal tumor; no growth.

Spleen: Many similar cells, few neutrophilic myelocytes, *few diplococci.*

Culture: *Many small colonies of diplostreptococci.*

Pericardium over tumor: Many endothelial cells, many degenerated vacuolated cells, no bacteria.

Retroperitoneal lymph gland: Many ordinary lymphocytes, few larger cells, no bacteria.

Liver: Many larger and smaller cells like those in bone marrow, few neutrophilic myelocytes, no bacteria. Culture: No growth.

Lung: *Many diplococci.*

Culture: *Many colonies of diplostreptococci.*

Kidney: Apparently nothing abnormal, no bacteria.

Left renal pelvis: The same.

Diagnosis.—Lymphosarcoma of anterior mediastinum. Leukemia, acute. Lungs, edema of, acute. Ganglion near sternoclavicular joint.

Tumor in mediastinum consists of framework of connective tissue in which are many large proliferative lymphocytes which show irregular distribution. Spleen shows pulp full of large lymphocytic cells. Enlarged lymph nodes: Marked hyperplasia of lymph adenoid tissue. Some show beginning leukemic infiltration of capsules.

Smears of blood taken before death show very large number of cells of lymphocytic type with large round, very deeply staining nuclei and narrow rim of hyaline protoplasm which stains distinctly blue and does not contain any granules. In some cells this protoplasm is arranged in knoblike pseudopods around the nucleus, few neutrophilic leukocytes and myelocytes, one eosinophilic myelocyte.

Case 3.—*Leukemia, myelogenous type. Anemia, pernicious (?).* James W., English laborer, aged 60, came to the Stanford Medical Clinic, Dec. 13, 1913, complaining of headache and rheumatism. Family history unknown. Patient had had malaria three times, 1894, 1897, 1907. Denied typhoid and scarlet fever. Had syphilis in 1884. Had had poor teeth; eight or ten had to be taken out. Had always been troubled with frequent colds, but had never coughed up blood or had pain in the chest.

Two months ago, patient contracted a bad cold. This disappeared after two weeks, leaving a nasal catarrh, persistent headaches, pain and stiffness in the shoulders and left elbow which had remained constant. About a month ago a diffuse macular rash appeared on the back, chest, abdomen and thighs, blood-red in color. It gradually faded without producing itching or pain. Patient had lost in weight and appetite, had coughed up mucus free from blood and had had some pain in the precordial region.

Physical Examination.—The principal features of the examination were: a poorly nourished old man with pale skin and mucous membranes, some deafness, many missing teeth with some pyorrhea, some rigidity of the neck, well-developed chest with scattered areas of impairment and a few râles; some enlargement of the heart to the left with a systolic murmur but with no irregularity; peripheral vessels definitely sclerosed, and a chain of enlarged glands along the right brachial artery beginning above the internal condyle of the humerus. There was considerable limitation of movement of the right shoulder joint. On the skin were many sharply outlined elevated, indurated, discrete, reddened papules, varying in size from a pinhead to a pea. Wassermann reaction was found to be negative in the blood and spinal fluid. No tubercle bacilli were to be found in the sputum.

Urine: Specific gravity 1.021; light cloud of albumin and a few granular casts.

First blood examination was as follows: red blood corpuscles, 5,152,000; hemoglobin, 92 per cent. (Dare); white blood corpuscles, 17,680; polymorphonuclears, 57; lymphocytes, 16; large mononuclears, 1; basophils, 26. The white cells were noted as varying greatly in size and shape.

There was no particular change in the patient for about a week except that the condition in the lungs improved; then he began to complain of a severe headache. The white blood corpuscles were 19,600, with 1 normoblast, December 13; 15,200 white cells, December 30.

December 16, gland removed showed simple, chronic inflammatory changes. The note is made that "the presence of large mononuclear cells with granular cytoplasm is suggestive of myelogenous leukemia, but the chronic inflammatory changes are the most prominent" (Dr. J. F. Cowan).

Later *leukemia of the skin* was diagnosed by Prof. William Ophüls on examination of a specimen removed.

Patient became more dazed with evident cerebral involvement and inclined to somnolence. In a blood culture taken December 26 there was a *growth of diplostreptococci in calcium carbonate infusion broth.*

Blood count, January 8: red blood corpuscles, 2,250,000; white blood corpuscles, 30,000; hemoglobin, 39 per cent.; color index, 0.86 per cent.

Differential Count (May-Grünwald-Giemsa stain):

Polymorphonuclears	58%	Basophil myelocytes	1%
Lymphocytes	11%	Eosinophil geta	2%
Large mononuclears	1%	Lymphoidocytes	1%
Eosinophils	0%	Immitationsform	1%
Basophils	0%	Normoblasts	1%
Neutrophils	23%		

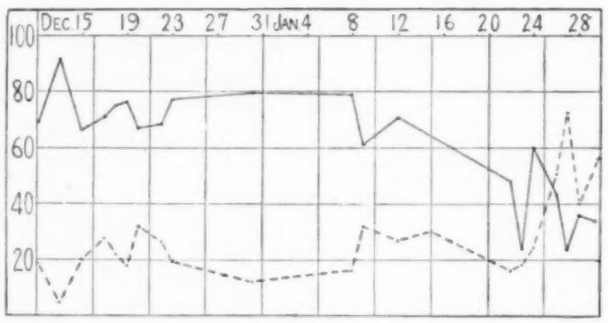

Fig. 2.—Relative numbers of normal and abnormal white cells: solid line, normal; broken line, abnormal.

New crops of reddened flattened papules occurred in different parts of the body from time to time, and small hemorrhages occurred about the eyes. The patient's condition varied from time to time, but he recovered from his stupidity and began to feel quite well day by day.

Negative blood culture, January 6. Later patient gradually became weaker, apparent thrombosis developed in some of the peripheral vessels, and patient succumbed January 31.

The following report of the morphologic blood changes was made by Dr. Thomas Addis:

"The routine differential count at the time when the patient was admitted showed the presence of certain atypical leukocytic forms. Further investigation revealed a blood picture of very unusual type.

"The red blood cells numbered 4,560,000, the white cells, 19,600. There were 64.5 per cent. of polymorphonuclear leukocytes, 27.5 per cent. of lymphocytes, 1 per cent. large mononuclears and no eosinophils. In general, therefore, no marked deviation from the usual percentage relationships. But here and there among these normal leukocytes were seen a few cells which gave evidence in their large size, large round faintly staining nucleus, and basophilic cytoplasm with sparse granules, of being in a very early stage of development. These cells were shown by means of the oxidase reaction to be of myeloid origin. They were the progenitors of the myelocytes, and showed as yet no sign of differentiation into neutrophil, eosinophil or basophil.

"Such cells of course are well known from their occurrence along with myelocytes in cases of myelogenous leukemia, and in themselves call for no remark. The point of interest lies in the fact that in this otherwise normal blood they appeared as a more or less isolated group, almost unaccompanied by their successors the myelocytes.

"A somewhat similar anomaly was found in connection with the red blood cells. A first glance at the smear gave no indication of anything but a very moderate grade of secondary anemia, but on further study some nucleated red cells were found. There seemed to be here again a want of some connecting link between these undeveloped cells and the great number of almost normal red blood cells.

"The further development is of considerable interest and the details are given in the chronological series of differential counts. In making these classifications the nomenclature of Pappenheim has been followed because the colored reproductions in his atlas have to some extent standardized the terms he employs. His method of using the May-Grünwald-Giemsa stain was closely followed, but quite as good results were obtained with Wright's stain. (Fig. 1.)

"The trend of development of the leukocyte changes is shown in a general way in Figure 2, which gives the relation between the number of normal white blood cells, and the number of the undeveloped leukocytes.

"As can be seen, there was no distinct change until a week before death, when the number of abnormal cells increased in number, so that toward the end there were more abnormal than normal cells. These cells were almost all promyelocytes and leukoblasts. The almost complete absence of fully developed myelocytes, which was noted as so striking in the early counts, continued to the end. On adding the percentages of all the counts made, there are only twenty-five fully formed myelocytes, as compared with 465 promyelocytes and leukoblasts. It appears as though very few of these cells had the capacity to develop into myelocytes. Their fate is probably indicated in the large percentage of unidentified degenerated cells and 'Kernschatten.'

"The red blood cells progressively diminished in number from 4,560,000 to 1,780,000 in forty-six days. At first there was a distinct secondary type of anemia, at least in so far as the color index was only 0.71, but as the anemia became more and more severe, the color index rose instead of fell until the day before death, when it was 0.92. In Figure 3, there is a graphic representation of the numbers of nucleated red blood cells found during the counting of 200 white blood cells. It will be noted that here too, as with the white cells, as the number of normal cells decreased, the number of nucleated red blood cells increased.

"During the last week the number of nucleated red cells was very large, and some enormous basic staining megaloblasts were found. The normoblasts seemed to be breaking down, and many free nuclei were thus liberated. In consequence it became difficult in many cases to distinguish between small lymphocytes and nuclei of normoblasts to which a rim of polychromatophilic cytoplasm still adhered. In spite of these large numbers of early forms of red blood cells, the non-nucleated red blood cells showed none of the degenerative and regenerative changes which are usually found when normoblasts and more especially megaloblasts are present in the blood.

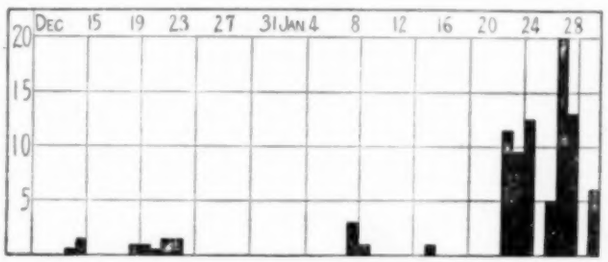

Fig. 3.—Increase in number of nucleated red cells as fall in number of normal cells takes place.

"To sum up, it may be said that the blood presented the remarkable combination of cells typical of an acute myeloid leukemia (lymphoidocytes, leukoblasts and promyelocytes) and of an acute pernicious anemia (gigantoblasts, megaloblasts and normoblasts) together with a large proportion of normal well-formed fully developed cells."

The accompanying table shows the differential counts, red and white cell counts and hemoglobin estimations from the time the patient came under observation to the day of his death.

Necropsy.—The necropsy, of which the following is a record, was performed by Prof. William Ophüls, Jan. 31, 1914.

On opening skull, some dark brown blood escapes from left side. Skull cap is normal.

Strongly built extremely emaciated man of about 60 years. Marked arcus senilis. Skin and visible mucous membranes extremely pale. Teeth fairly well preserved and poorly kept. Marked enlargement of deep cervical supraclavicular and axillary lymph glands on left side. Marked enlargement of glands in both inguinal regions. In skin over chest, both upper arms, belly, thighs and on back are large number of white projecting nodules from just visible to 3 mm. in diameter. Majority are surrounded by hemorrhagic zones. Skin over back of both hands markedly atrophied and full of hemorrhages. Irregular hemorrhagic discoloration of skin on dorsum of right foot. Left foot deeply cyanosed. Tissues shriveled and dry. No edema. Old irregular scars with pigmented margins, largest one 8 by 5 cm. in diameter. Very marked atrophy of subcutaneous fat and muscle. Peritoneum pale, moist. Liver projects 2 fingerbreadths in right mammary line. Stomach and transverse colon in normal position. Appendix back of cecum, which is distended markedly with feces. Marked atrophy of omentum. No free fluid in peritoneum. Numerous small hemorrhages in periosteum of ribs. Diaphragm fifth on left, right-fourth ribs.

Strong adhesions between anterior part of left lung and sternum. In ribs there is very little bone marrow. On pressure there escapes a thin very slightly turbid fluid. Bone marrow of sternum is light grayish red. In some places are large hemorrhages. Fairly easily broken old adhesions very nearly obliterating pleural left cavity. Similar adhesions on right base. Easily broken adhesions on right apex. Few small hemorrhages in pericardium. Extensive, easily broken old fibrous adhesions about spleen. Capsule is irregular, thickened and deeply pigmented, 12.5 by 9.5 by 5 cm. Cut surface of spleen shows brownish-red color with purple spots beneath capsule. Pulp is quite soft.

Heart is of normal size. Large milk spot over right ventricle. Large postmortem clots in pulmonary artery. Wall of right ventricle very thin, dark brown.

Along closing line of posterior part of large and of small flap of mitral, also on closing line of two of the aortic cusps, are small grayish apparently quite recent thrombotic deposits. Deposits on aortic valves are slightly thicker. Base of aorta and coronary arteries normal. Heart muscle on left side, dark brown and flabby.

Old scars at base of mesentery of sigmoid flexure. Large amount of thin yellow fecal material in sigmoid flexure and rectum. Small amount of light clear urine in bladder.

Diagnosis: Leukemia. Endocarditis, acute. Pachymeningitis, hemorrhagic. Bronchitis, acute. Bronchopneumonia.

Smears: Aortic valve: Many reds, many myelocytes, no bacteria. Mitral valve: Many reds, many myelocytes, *moderate number of diplococci.*

Marrow: Many large neutrophilic myeloblasts, few neutrophilic leukocytes, few basophilic myelocytes, very few eosinophilic myelocytes, few nucleated reds, few large vacuolated cells containing fragments of cells and of nuclei, also some pigment, *few groups of diplococci partly free, partly in phagocytes,* few normoblasts.

REPORT ON THE MORPHOLOGIC BLOOD CHANGES IN CASE 3

	December									January									
	11	13	15	17	18	19	20	22	23	30	8	9	12	15	22	23	24	26	27	28	30
Neutrophil polymorphonuclears	47	64.5	47.5	58	58	57.5	53.5	55	53	59.5	69	48	54	43	38.5	18.5	29	35	22	15	17
Lymphocytes	22	27.5	17	11	15	17.5	12	13	24.5	15	10	14	16	20	9.5	6.5	32	7.5	2	19	14
Large mononuclears	1	0	1	1	1	0	1.5	0	0	5	0	0	1	1	0	0	0	0	0	0	1
Eosinophils	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Basophils	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0	1	3	1
Unidentified degenerated cells	9	2	6	0	3	3	1	2.5	2	5	3	7	1	4	8.5	16	0	1	1	10	8
"Kernschatten"	3	1	7	1	2	3	2	2.5	1	3	1	0	1	3	26.5	41.5	13	5.5	1	14	3
Metamyelocytes (neutrophilis)	3	0.5	1	4.5	0.5	0	0.3	4.3	1	3	1	1	5	8	2.5	0.5	1	4.5	5	2	3
Neutrophil myelocytes	1	0.5	1	2.5	2.5	5	0	3.5	0.5	0	0	1	0	1	0	0.5	1	2.5	0	0	2
Eosinophil myelocytes	1	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
Basophil myelocytes	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0.5	0	0	0	0
Promyelocytes	5	0.5	15.5	17.5	12.5	12	16	16.5	10.5	3.5	15	14	7	14	4.5	4	3	13.5	7	7	6
Leukoblasts	8	1.5	7	2	3.5	1.5	10	1	5.5	2	1	12	13	6	7	8	18	28	61	28	42
Lymphoidocytes	0	1	4.5	2.5	2	0.5	3.5	1	0.5	1.5	0	3	2	0	2	3.5	2	1.5	0	2	1
Free nuclei of normoblasts or lymphocytes(?)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	20	10	28	19	8	23
Normoblasts	0	0	0	0	0	1	1	0	0	0	1	1	0	0	8.5	3.5	12	2.5	20	10	5
Megaloblasts	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3	0	1	2.5	0	3	1
Gigantoblasts	0	0.5	1.5	0	0	0	0	0.5	1.5	1.5	0	0	0	0	0.5	0.5	0	0.5	0	0	2
Red blood cells (in millions)		4.56	....	....	....	....	....	....	....	....	2.35	..	..	..	....	....	2.03	....	1.86	1.78	..
Hemoglobin (per cent.)		65%	....	....	....	....	....	....	....	....	39%	..	..	..	....	....	31%	....	33%	33%	..
Color index		0.71	....	....	....	....	....	....	....	....	0.86	..	..	..	....	....	0.85	....	0.9	0.93	..
White blood cells (in thousands)		19.6	....	....	....	....	....	....	....	15.2	39.0	..	..	..	9.0	....	9.0	....	28.0	29.0	..

Spleen: Many neutrophilic myeloblasts, few neutrophilic and eosinophilic leukocytes, many small and large lymphocytic cells, no bacteria found.

Microscopic Examination.—Bone: Very cellular marrow rich in myelocytes, periosteum shows marked infiltration with myelocytes.

Spleen: Marked hematogenous pigmentation. Malpighian bodies small; pulp crowded with large myelocytes.

Lymph gland: Marked quite diffuse infiltration with myelocytes.

Heart valve: Shows fibrous cellular thickening on one side covered with thrombus. Thrombus is very dense, free from cells.

Section of skin shows accumulation of myelocytes about blood vessels in cutis.

Abdominal aorta: Large atheromatous ulcer.

Lung: Hyperemic, few pigmented scars. Blood in blood vessels rich in myelocytes.

Kidney shows few small arteriosclerotic scars, many small areas of myelocytic infiltration.

Liver shows moderate filling of capillaries with myelocytes, some also in periportal connective tissue.

Lung shows bronchitis and beginning bronchopneumonia.

Radial artery shows slight arteriosclerosis.

Sections of marrow show large necrotic areas apparently due to thrombotic masses in vessels. Much fibrin between necrotic cells; large hemorrhages at edge of necrosis; also quite advanced organization in some places. No bacteria found in necrotic areas. The adjoining living marrow is crowded with a moderate number of mitoses; myeloblasts; shows few red cells and very few nucleated reds. Very few eosinophilic myelocytes. Scattered throughout the marrow one finds a considerable number of large phagocytic cells which contain fragments of degenerated cells, frequently pigment and finely granular detritus. *In some of these cells groups of diplococci as described in smears. There are also few scattered diplococci free in the marrow.* One of the sections of marrow is somewhat different from the rest (probably section of vertebra, whereas others are from ribs and sternum). In this piece there are no necroses. The proliferation of myeloblasts is still more marked and occurs in the form of small badly defined tumorlike nodules which measure about 2 mm. in diameter. No bacteria found in these slides in spite of continued search with mechanical stage.

COMMENT

We have, then in the foregoing cases one of the acute lymphatic type with mediastinal tumor, a practically normal blood count when first seen and then with the clinical picture of an acute infection, rapidly increasing lymphocytosis, hemorrhage and death, another with similar mediastinal tumor but with a more prolonged course, but so evidently an infection as to be confused with pulmonary tuberculosis; and a third with slow development, typical skin and other reaction and with evidence of the involvement of the whole bone marrow, including the red blood cell forming portions (Pilcher[56]). The bacteriologic studies made of the last two cases were not at all conclusive, but were suggestive. In Case 3 streptococci were found in the blood thirty-three days before death. The early invasion of the bone marrow seems proved by the study of the blood given above, the changes in the white blood corpuscles and the appearance of megaloblasts and normoblasts, together with the progressive anemia. The definite relationship of bone-marrow infection to pernicious and other anemias and to the leukemias is certainly favored by a careful study of this patient. In infections it seems at times as if one part of the bone marrow responds, the red cell forming (Gorjaew[42]), and then in another white cell deviations occur; but here toward the end all parts of the bone marrow seem involved. This is, of course, accompanied by more or less change in the spleen, lymphatic tissues, etc. It is true that while streptococci were found in the marrow after death, they were not so placed as to be clearly present in the lesions characteristic of leukemia. This may be a secondary infection with streptococci, but clinically the picture of a progressive bone marrow infection with primary involvement of the white blood cell forming portions is difficult to lay aside. In Case 2 the streptococci are more evidently terminal invaders. The skin lesions in Case 3, with their surrounding hemorrhagic areas, certainly could readily be interpreted as metastatic (Hitschmann and Lehndorff,[57] Arndt[35]) processes such as we commonly see in streptococcic infections even of low virulence, and they speak for the infectious origin of the disease.

The well-known wide range of activity shown by the streptococcus, and its tendency to obtain and retain a foothold for long periods of years within the body in the endocardium, tonsils, bowel, about the teeth and elsewhere would indicate the strong probability that the bone marrow is often likewise infected and that streptococci may retain a hold there and so induce the more chronic types of lesions associated with leukemia. In California, low-grade diplostreptococci infections are common, such as the characteristically mild rheumatic fever erythema nodosum, probably erythema multiforme, bacterial endocarditis, at least some cases of hyperthyroidism, tonsillitis, intestinal lesions, etc. These, or tuberculosis, or both, may explain the fact that the lymphocyte count, as has been shown by Mehrtens,[58] is apt to be high, at least in San Francisco.

These points with others lend color to the belief that the actual presence of streptococci in the bone marrow has a definite etiologic part to play in the development of the leukemic picture observed. Only by further bacteriologic and perhaps protozoologic studies of the blood, bone marrow, spleen and lymph glands of such patients, and by animal inoculation from the tissues involved, including bone marrow trephined from living bone, can we clarify this problem.[59] If we can force the leukemias into the diseases of known origin we have gone a long way toward the solution of a reasonable and effective therapy. Remedies damaging the bone marrow, such as benzol (benzene, C_6H_6) and chloroform are now in common use, but they are dangerous and usually fail. We must not let the fact of chronicity in many cases divert our attention from the possibility that there is an active, even though mild, infection going on. Unfortunately there is at present not sufficient evidence accumulated to give assurance as to the real cause of leukemia, but we feel justified in the following conclusions:

CONCLUSIONS

1. The evidence thus far available points strongly to infection as the cause of the leukemias. It is probable that organisms usually of low virulence but of various kinds, perhaps working on a soil prepared by

56. Pilcher, J. T.: A Contribution to the Etiology of Pernicious Anaemia, Am. Jour. Med. Sc., 1913, cxlvi, 226.

57. Hitschmann, E., and Lehndorff, H.: Ein Fall leukämieartiger Erkrankung mit schwerer megaloblastischer Anämie und eigentümlichem Exanthem, Ztschr. f. Heilk. Int. Med., 1903, xxiv, 190.

58. Mehrtens, H. G.: The Frequency of Low Polymorphonuclear Leukocyte with High Lymphocytic Differential Counts, Arch. Int. Med., August, 1913, p. 198.

59. Hansemann (Berl. klin. Wchnschr., 1914, li, 9) has asked that all such information be reported to him in order that he may assemble all available information pointing to infection as the cause of leukemia.

previous infections, can, when they secure a foothold in the bone marrow, spleen or lymphatic glands, bring about the leukemic reaction alone or combined with disturbance of the red blood cell forming mechanism.

2. Streptococci have been more frequently reported than other organisms in the blood and tissues of leukemic patients.

3. The attempt to classify rigidly the leukemias and pseudoleukemias on purely morphologic grounds is futile.

4. A long series of bacteriologic studies, including blood cultures and bone marrow inoculations from living patients, will be required to settle the relationship of infection to the leukemias as well as the anemias.

5. Foci of infection should be sought, and treatment directed against them. Only with the establishment of the cause can we hope for a sound therapeusis of this condition.

ABSTRACT OF DISCUSSION

DR. CARL R. KRONE, Oakland, Calif.: I must agree to Dr. Wilbur's conclusion that leukemia is an infection, in particular the result of infection of the bone marrow. My findings, important by themselves in other respects, show that twenty-four hours after administration of chloroform in a case of tuberculosis of the lungs followed a period of hematopoietic activity expressed by a gradual increase of leukocytes and a likewise gradual decrease of erythrocytes. This activity was not due directly to the 20 c.c. of chloroform inhaled during one hour at each treatment, because the result, a maximum of 19,000 leukocytes and a minimum of 1,520,000 erythrocytes, was achieved only at the end of fifteen days, when the chloroform had long been eliminated. The chloroform, however, I claim, may have dissolved the lipoid matter surrounding the tubercles; also probably extracted at least in part the waxy substances of the capsules of individual bacilli, rendering the latter less viable or more vulnerable, and carried numbers of them away in the blood stream. The leukocytogenetic function was stimulated by this sudden invasion of less virulent bacilli and we witness a powerful influence on the entire hematopoietic system. This is the fact which connects my findings with Dr. Wilbur's conclusion that leukemia is an infection. In my case the blood picture, abnormal after fifteen days, approaches the normal in thirty days more. There are no myelocytes or other abnormal white cells, indicating by their absence that the hematopoietic system has not become injured by infection of the bone marrow. However, we may not exclude a possible infection and injury of that system and consequently a possible leukemia, especially if the *causa morbi* be not *Bacillus tuberculosis* but diplostreptococcus. Dr. Wilbur sees the case at the end of the story, when the *causa morbi* cannot any more be eliminated. I see the same case at its beginning, when the hematopoietic system is still intact and responds to normal stimulation of its defensive elements against an apparently less virulent invasion. I may add that clinically my tuberculous patient is doing well under the treatment with chloroform inhalation.

DR. MAX EINHORN, New York: The question whether leukemias are infectious is very important, and the mass of experience would tend to favor such a view. In acute leukemia we have more evidence as to the infectious character of the disease. I will only mention one case in my own experience, in which sickness began with disease of the throat, an acute condition that first appeared to be an acute tonsillitis. The patient was treated for a week or so and then came to the hospital and was under my observation. In a few days he developed more throat symptoms, swelling of the tongue and larynx, and soon we were able to make a diagnosis of acute leukemia. The lymphocytes were greatly increased. I think they amounted to 92 per cent. of the white blood corpuscles. He had a very high degree of leukemia, the white blood corpuscles being one to four or five of the reds. He died in four or five weeks, the symptoms being those of an acute type of irregular fever with swellings and hemorrhages. That is the way the acute leukemias do; the patients die in a month or two. Dr. Sunderman of New York has made observations in which the acute leukemia could apparently be traced to an infection. In my own case no blood cultures were made and no definite bacteriologic proofs were obtained, but clinically it was undoubtedly an infection. In one case a streptococcus was found. Possibly that was not the real cause of it, but there must be something that leads to the infection. At any rate, these cases are of great importance and I think we should all try to furnish material for study and not rely on necropsies in the study of the leukemias. We should be able to recognize the disease before necropsy.

DR. J. A. LICHTY, Pittsburgh: I think we all agree that it would be very fortunate if we could find the cause for the primary anemias in infection. Dr. Wilbur's paper carries us one step further in this direction when we find infections such as he has described. Yet there are many questions which come up, especially as to whether the micro-organisms which he found in his case were after all the etiologic factor. In many of these primary anemias, and especially in pernicious anemia, we find an elevation of temperature toward the termination of the disease. We can hardly think of anything else but that there is an infection, probably a terminal infection. Probably the vitality of the organism is such that micro-organisms which are not harmful ordinarily for the normal body become virulent and pervade the various tissues. I regret very much that Dr. Rosenow is not here to discuss this paper, because he has done so much work along the line of the subinfections. In pernicious anemia particularly we see the terminal elevation of temperature. In a fatal case of pernicious anemia at the Mercy Hospital, Pittsburgh, colon bacilli were recovered from the bone marrow, which was very interesting but hardly conclusive. Such work as Dr. Wilbur's will have to be pursued until we prove or disprove the infectious nature of these diseases.

DR. R. L. WILBUR, San Francisco: I have no idea of claiming that we have proved that the diplostreptococci are the cause of leukemia. But we have found the diplostreptococci, and we have much proof that leukemia is infectious. It is important to make studies of the bone marrow in these cases, particularly from living patients, which will probably advance our knowledge of this disease much more rapidly than in the past. Specimens for such study may be readily removed under general or local anesthesia. It is important to take care of foci of infection. As to the care of the tonsil in leukemia, that is a question. Are we to take out the tonsils in leukemia? There is the possibility of a lighting up of the process and the death of the patient. If the affection of the tonsils seems to be responsible for the leukemia, we should take them out.

Defects in Schoolchildren.—The *Bulletin of the Chicago School of Sanitary Instruction* says regarding medical school inspection work that it is a service rendered by the department of health for which the taxpayers pay, but unless the parents do their share by having defects attended to after their discovery by the inspectors the money expended is wasted. The department's figures regarding this matter are interesting. In 1914 there were 75,476 examinations made, 45,176 children were found defective and 35,425 were advised to seek treatment. In each of these instances the parents were informed by a note of the nature of the ailment and treatment was suggested, but only 9,244, or 40 per cent., acted on this advice. In detail the figures were as follows: Of 4,054 cases of adenoids, 737, or about 18 per cent., were treated; diseased tonsils, 5,754 cases, of which 223, or a little over 4 per cent., were treated; discharging ears, 1,254 cases, of which 118, or a little over 10 per cent., were treated; defective vision, 9,364 cases, of which corrections were secured in 1,826, or a little over 12 per cent.; diseased eyes, 7,449 cases, of which 138 were treated, or a little less than 2 per cent.

ABORTION

ITS CAUSES AND TREATMENT *

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The present age is one of conservation. In every line of human industry the effort is made to preserve and utilize Nature's forces. In the machine shop and factory, careful study is made to prevent loss of material and energy. Fortunes are acquired through the utilization of by-products which formerly were allowed to waste. The great exception to this rule is in the promotion and preservation of the race. Every gynecologist who studies the histories of those who pass under his ministration must be impressed with the terrible sacrifice of human life, purposely or accidentally, during the period of gestation. The mental attitude of many individuals is such as to impress one that they regard the sole purpose of their union to be their personal gratification, rather than to propagate the race and preserve the species. Their study is how to gratify desire, and to avoid its consequences. Procreation, the higher purpose of such association, is regarded as an unfortunate sequel to be avoided if possible, or entertained only when the conditions may seem opportune. When such a mental attitude is assumed toward the processes of life, the disappointment is grievous when the exercise of the sexual function results in conception. Such persons are distressed by and offended at the physician who informs them there is no immune period or uninjurious means to prevent it. The couple who have entered wedlock with the avowed determination to avoid the discomforts and responsibilities incident to pregnancy are mentally prepared to go further and institute measures to arrest life's processes, and destroy the life whose germination has been entrusted to their fostering care. It is a sad reproach on our civilization, an ominous danger to our nation, that those who are able to and should find delight in rearing and fostering their offspring will allow themselves to be diverted therefrom by less weighty matters. Our profession could not do a greater service to humanity and to the state than to continually impress on such patients the sanctity of human life in all its processes, and that procreation is the primary purpose for mating of the sexes. We must admire and respect those women who regard sterility as a reproach, and loss of the immature embryo as a cause for grief and distress.

Aside from any moral issue, Nature asserts her penalty on all who violate her laws. Changes occur in the genital structure of those who practice measures to avoid conception, which render them subsequently less prone to pregnancy, so that having reached a period when they desire offspring their hopes are denied. The changes are more marked in those who have interrupted the course of gestation. The inflammatory processes resulting unfit the uterine mucosa for the proper nourishment of its incumbent, and abortion becomes a habit; a habit which is to be overcome only by the restoration of affected structures to a healthy condition. It is possible for inflammation through infection to induce such injuries of the muscular structures of the uterus, tubes and pelvic peritoneum, as to render the uterus unable to enlarge sufficiently to permit the maturing of the fetus; or the tubes are so contracted that no opportunity is afforded for the union of a spermatozoid with an ovum, or the impregnated ovum is prevented from entering the uterus and a misplaced pregnancy results, adding to the gravity of the condition.

No one can consider the immediate and remote possible infective changes following interference with gestation without realizing the baneful influence of infection on the health of the individual. Pathogenic conditions are engendered which may be slight and evanescent, or there may be structural changes which absolutely preclude future procreation and handicap the individual for life — may even cause death. Although procreation may be continued, is it not possible that slight changes in the structure may so limit the nutrition of the ovum as to impair its complete development and thus affect the future mental or physical course of the offspring, and even influence its progeny? A widespread disinclination to procreation must have its influence on the interests of the nation. A nation's strength is dependent on the moral and physical courage of its men; hence, any cause which tends to limit procreation among the fit becomes a double crime, injurious to the public as well as to the individual.

Some members of the profession are advocating the legalization of abortion. Could any course be more disastrous! In all aggregations of population vice and crime are controlled through the force of public opinion. In every large city there are those who thrive as professional abortionists, who are so protected by the sympathizers with vice as to make their conviction and punishment difficult. That the production of abortion is a crime, and its practice disreputable, deters the physician who has any regard for his reputation from its employment. Its legalization, however, opens a door for its more general practice, when patient and physician could regard such a course justified by law and within the choice of the affected individual. Such a situation becomes an encouragement to vice and immorality, and prejudicial to the interests of the state. Without question every physician is familiar with unfortunate instances when girls of good family have been victimized or have yielded to overpowering temptation, but these do not justify interference with the laws of life by arresting its progress. However much the social situation of such individuals and their parents appeals to the physician, it should be an accepted dogma that those who violate the laws of society must pay the penalty.

CAUSES

Abortion may be the result of overexertion, infection or injury, but most frequently in first pregnancies through efforts to secure evacuation of the uterine contents by the administration of drugs or by mechanical measures. When the uterus is the seat of disease from previous infection or interruption of pregnancy, the pathogenic changes render the organ incapable of nourishing the incumbent until full term, and the contents are evacuated. When pregnancy recurs abortion becomes a habit. Frequently this is attributed to syphilis, which may be the cause, but it occurs more frequently independent of it.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

TREATMENT

The treatment of abortion consists in the preventive when threatened; the prophylactic when conditions exist which ensure its occurrence or when pregnancy occurs in cases in which the tendency has become a habit; and finally, completion of the evacuation of the uterus when abortion is inevitable, or has partially occurred.

Threatened abortion is best treated by absolute rest. The exclusion of all causes of excitement, the administration of an opiate, preferably by suppository or hypodermically, an easily digested, nutritious diet, the administration of laxatives and avoidance of remedies such as ergot, cotton root, quinin and strychnin, which increase the uterine irritability.

The prophylactic treatment is employed with those who have previously aborted, while nonpregnant, and consists in the improvement of the pelvic condition. The use of the curet in endometritis; surgical treatment of lacerations, extensive abrasions, eversion of the mucosa and extensive involvement of the racemose glands of the cervix should be regarded as indicated. Retrodisplacements and prolapsus should be corrected. A syphilitic history should be an indication for antisyphilitic treatment, and in all cases of habitual abortion, whether specific or nonspecific, potassium iodid will be found an invaluable agent. Its administration should not only precede pregnancy, but should be continued with more or less persistency during the early months. This drug diminishes the irritability of the uterine mucosa and ensures the continuance of pregnancy when an abortion would otherwise be inevitable.

INEVITABLE AND INCOMPLETE ABORTION

When it becomes evident that abortion will occur in spite of measures to avoid it, the early aseptic evacuation of the uterus is advisable. The natural inclination of the physician when consulted by a patient who has undergone a recent abortion is to make sure that the embryonic products have been completely evacuated, particularly if there are present symptoms of infection as indicated by elevation of temperature, rapid pulse, tenderness over the abdomen and pain in the pelvis. The friends of the patient attribute such phenomena to retention of portions of the products of gestation, and are insistent on measures for removal. When the symptoms are not ameliorated they become obsessed with the idea that the procedure has not been complete, and in many instances secure another consultant to repeat the process. No plan of treatment could be more detrimental to the interests of the patient.

During the five years, inclusive from 1910 to 1914, there have been treated in the gynecologic wards at Jefferson Hospital, 296 patients who were admitted under the designation of incomplete abortion. The great majority of these patients were suffering from symptoms of infection on admission; in many of them infection was well advanced and the condition practically hopeless. Many of them had undergone curettement prior to entering the hospital; 127, or nearly 43 per cent., were subjected to some surgical procedure after admission. There were 13 deaths in the entire number admitted; 5 of these were subjected to surgical measures after admission, while 8 were not treated surgically. The apparent percentage of mortality is 3.8 per cent. for those surgically treated, and 4.7 for the medically treated cases. At first glance it would appear that surgical measures afforded the most hope, but it must be remembered that no patients were refused admission, and only those were subjected to surgical procedures in whom local foci of infection were evident. While the profoundly infected patients were treated by supportive measures, careful analysis of the cases convinces me that a smaller mortality would have occurred had we received these patients before they had been subjected to any surgical interference, and subsequently confined our treatment to nonsurgical measures.

Nature has arranged her forces to expel the uterine contents when they have completed their function, or when they are no longer in condition to continue it. In addition she affords ample protection against infection unless her barriers are injudiciously broken down. Every examination and all manipulation of the genital structures of an aborting patient should be strictly aseptic, and when such conditions are difficult to attain, the vulva should be kept covered with clean napkins wrung out of a mixture of equal quantities of alcohol and water, while pituitary extract should be administered hyopdermically to promote expulsion of contents and closure of vessels.

It is often hard to resist one's inclination, and the importunities of relatives of the infected individual that some interference should be made in patients appearing with symptoms of infection following abortion, but it should be remembered that even admitting the retention of embryonic products, the infective organisms to not limit themselves to the local area. If they have not already invaded the blood, the manipulation necessary to explore and remove the retained tissue breaks down the barriers Nature has erected against further invasion.

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ABSTRACT OF DISCUSSION

DR. ALFRED BAKER SPALDING, San Francisco: Retroversion of the uterus predisposes to abortion in the early stages of pregnancy probably more than any other one thing, and often causes the death of the fetus; the so-called "blighted ovum." The attendant who corrects the retroversion is often unjustly blamed for the death or miscarriage of the fetus. I have in my laboratory several specimens of blighted ovum passed some months after replacement of a pregnant retroverted uterus which show an early stage of development at the time of death.

There has been for some years a growing tendency among gynecologists and men of experience to present to the profession the idea that the surgical emptying of the uterus is bad in principle and bad in practice. I am not one who agrees with this statement. There is undoubtedly a difference between the infected and the uninfected patient following the abortion; but in either case it has been my practice, and the practice of Dr. Somers, who preceded me in the woman's clinic of Stanford University, to dilate and curet the uterus immediately after the patient enters the hospital. I do not know what Dr. Somers' results have been, but I do know my experience. In the last three years we have had eighty-six patients enter with symptoms of incomplete abortion. All, with the exception of one, were treated surgically. One was not treated. Three were treated by means of manual curettement of the uterus and the other eighty-two patients were treated by dilatation and curettage. None of these patients had been curetted before entering the hospital, which may make a difference in the statistics. Of these eighty-six patients only one died. Dr. Stephenson gathered together as many of these histories as possible. Of the forty patients reviewed, the temperature was normal on admission to the hospital in thirteen cases and from 99

to 103 in twenty-seven cases. After operation, the temperature either remained normal from the day of operation or returned to normal in seventeen cases; ten were normal the first day after operation, making twenty-seven cases; five returned to normal on the second day after operation, making thirty-two; three returned to normal on the third day, making thirty-five; one returned to normal on the fourth day, making thirty-six; two, fifth day following operation, making thirty-eight, while only two persisted with elevated temperature for seven days. Twenty-three had a leukocytosis before operation of over 9,000, some as high as 30,000, showing another evidence of probable infection. As to the cause, twenty-four stated that abortion came on spontaneously, and sixteen acknowledged that they had brought it on criminally. Of late it has been our practice to test the mothers for syphilis in case of an unexplained abortion. In four recent cases, all gave a negative Wassermann on examination. I present these statistics, hurriedly gathered together, to show that patients can be well treated by clearing out the uterus promptly, although at the same time I am sure Dr. Montgomery can in general practice show that many patients can empty the uterus spontaneously and are better untampered with. I wish to point out, however, that at present I cannot see the reason for not emptying the uterus in abortion.

Dr. John Osborn Polak, Brooklyn: Before this section and before the American Gynecological Society we have called attention for several years to the treatment of infected cases by the so-called palliative methods (so-called judicious neglect plan) versus operative procedure, and our results have been so exceptionally good that we have rather felt that the profession should share with us in the little knowledge that we have gained by the study of this procedure.

We divide abortions into the infected and the noninfected cases. I do not believe that any of us feel that in a noninfected case the uterus cannot be entered with safety and if the evacuation is complete and clear, perhaps the convalescence of that patient will be expedited; but I do know that the infected case which has protected itself, as each infected case does protect itself, by a leukocytic wall, and if a placenta is present and thrombi are formed in the vessels in the placenta site, that the infection is spread and the patient's condition is jeopardized by the routine procedure of curettage.

The question of interference in abortion is this: Is there hemorrhage or is there not hemorrhage? If there is no hemorrhage, our experience has been, even when the temperature is 104 or 105, that those patients, if placed in the Fowler position, an ice pack put over the abdomen and elimination maintained with saline solution and intestinal rest, with no cathartics and no food, show—inside of twenty-four to seventy-two hours—great improvement; the products will separate, for they have been starved off by the formation of the round-cell deposits, and the product of conception will be delivered completely, if left alone, in the large majority of cases. If it is not delivered spontaneously, it is found with the uterus contracted and this large mass lying in the dilated lower segment of the uterus. We have, for instance, reported twenty consecutive infected cases, before the International Congress, with the complete contents of conception left *in situ;* every one of those patients made a complete recovery, the uterus expelling its contents spontaneously, and we believe just in proportion as these cases are interfered with, so is the morbidity increased. In a hundred consecutive cases, sixty-three had been curetted one or more times, and all of these showed exudates. On the other hand, in 200 consecutive cases admittedly infected, without interference, we found that in this series of cases our morbidity as to exudates and as to mortality was decreased. It is a pleasure to hear Dr. Montgomery, whose word covers such weight, protest against this active interference in abortion.

Dr. C. Lester Hall, Kansas City, Mo.: We all feel keenly the outrage that has been committed by the profession on the pregnant woman in the way of producing abortion. It is now many years since I first heard a man, or several men of high standing, in the discussion of this subject, flatly acknowledge a willingness to produce abortion in the maiden who had been unfortunately caught. My protest on that occasion, whether it had any lasting effects or not, was so emphatic that it has been my good fortune not to hear these men repeat this statement. The outrage is so monstrous that we cannot accentuate it too strongly. I feel that it is not done now as it once was done. I believe the profession is rising above this nefarious practice. In regard to the treatment of abortions, I think it depends very much on circumstances. I believe it would be justifiable in almost any case, if the obstetrician were sufficiently clean, to empty the uterus with a blunt instrument; to swab out the uterus once, and never again. It is the continual meddling that brings dire results, and even with all our care it is liable to produce septic conditions.

I know the value of the protective wall that nature has thrown out, and over and over again it has been my fortune, and I believe with good results, to stay the hand of the energetic, aspiring young obstetrician who wanted continually to meddle with these cases. We know the deleterious effect of uterine douching. In regard to giving these patients potassium iodid, that Dr. Montgomery refers to, to make a woman carry a baby to term, I would object to the giving of the potash. I think we might give iodin itself with safety, but in all these cases we are apt to have more or less kidney trouble, and I believe in giving potassium iodid we load up the system with this potash which is toxic and detrimental. I protest that in women with albuminuric conditions we should avoid the use of potassium iodid or other potash salts.

In regard to retrodisplacements of the uterus of the pregnant woman, it is a great misfortune if we cannot institute some measure whereby we can make this woman carry her child to term and prevent the recurrence of the retrodisplacements. This is the *only* nonsurgical way we can correct these displacements. This I have often done, and by the postural treatment after delivery recurrence of the retrodisplacement has been prevented. This will happen in 99 per cent. of all cases in which the retrodisplacement has existed before pregnancy.

The subject is so important, and coming from Dr. Montgomery, is so effective that I am sure if any young man here has been imprudent in the use of instruments after abortions, the doctor's paper will have a lasting good effect, and it will do us *all* a great deal of good.

Dr. S. M. D. Clark, New Orleans: It seems that we are about to agree on some standard method in handling abortions. In noninfected cases I believe with Dr. Montgomery the sanest plan is to empty the uterus with as little traumatism as possible and then leave an iodin wick for twenty four hours. The infected abortions are the ones on which there are still divergent opinions. It took a goodly experience before I could break away from the old plan of emptying the uterus in these cases. After all, the pathology should guide us, and when this is thoroughly understood, the locally inactive plan is the method that best complies with these laws. When called in consultation, how often have each of us found the physician giving daily intrauterine douches; he generally curets and if the temperature materially rises, feeling that there is still something remaining, he again curets. The pressure of the anxious family forces him into some local activity; he feels that he must be doing something, so he goes ahead douching and curetting. This daily mauling is repeated, not so much for the patient, but for the family. Where the infection is already beyond the endometrium, nothing could be more unreasonable than to expect relief by superficially fussing around in the interior of the uterus. Let such cases alone, adopt the locally inactive plan, furnish an abundance of fluids and keep the patients well nourished. The infection in practically every case will localize; an immunity will be established; the patient will autogenously vaccinate herself and the exudate either resolve or suppurate.

The importance of the lower segment of the uterus in these infected abortion cases has not been given due consideration. In many of our cases the upper segment is never involved, but rather the infection has struck directly out toward the parametrium through the richly supplied lymphatic circulation of the cervix. This is the type in which the true pelvic connective tissue abscess is found, which when drained is immediately cured. Could anything be more unreasonable than to curet in such cases? I think a point to be driven home is the extreme importance of exercising the most rigid asepsis when making vaginal examinations in diagnosing cases of abortion. The vaginal canal should be explored with the same aseptic regard as one would invade a knee joint or the abdominal cavity.

DR. H. G. WETHERILL, Denver: In the treatment of these cases it is important to determine whether one is dealing with a spontaneous abortion or a mechanically induced abortion. Infections of the genital tract are commonly retrograde infections if the abortion is mechanically induced, or if there has been gynecologic tinkering. If, on the other hand, it is an incomplete abortion, not of the mechanical type, then we certainly are justified in picking out with the placental forceps any retained portion of the product of conception which might otherwise give rise to sapremia. With this exception, I agree wholly with the principles of treatment set forth by Dr. Montgomery and I am heartily in accord with him in his strictures on the abuse of the uterine curet in such cases. So careful should we be in handling infected cases that a tenaculum or volsellum forceps should not be used to draw down and fix the cervix, as the small punctures made by the teeth of the instrument are sufficient to reinoculate a patient from the vaginal and cervical secretion.

For many years I have treated infections following abortions with alcohol after the method of Caruso. A double drainage tube of large caliber is inverted on itself, so that the solution cannot follow the tube. This tube is introduced to the fundus with strict antiseptic precautions and the alcohol which is used through it flushes the genital tract from the fundus outward with a nonpoisonous, antiseptic solution. Occasionally a solution of permanganate of potash or a diluted solution of iodin is substituted for the alcohol. In the treatment of such cases it is very easy to do too much and almost impossible to do too little. The majority of the patients will recover if let alone.

DR. E. E. MONTGOMERY, Philadelphia: I must confess that if called to a woman who had an abortion or was aborting, in whom a portion of the embryo had escaped, whom I had reason to feel was not an infected case, and in making a careful aseptic examination discovered a portion of the placenta projecting, I should be tempted at once to evacuate the uterus; but in cases such as one of the gentlemen mentioned in which the mass is situated within the body of the organ, the cervix, possibly, more or less contracted, the result of leaving the case to nature, treating it carefully, aseptically, will be attended with much less danger to the patient than would be the mechanical dilatation of the uterus and the removal of the structures within. I believe, also, in those cases of which Dr. Wetherill has spoken, in which a portion of the placenta remains and it is evident that sapremia exists, it is better to leave the condition undisturbed and trust nature to evacuate it rather than use mechanical measures.

Railway Accidents.—According to *Accident Bulletin 55* of the Interstate Commerce Commission, for the first quarter of 1915 the number of persons killed in train accidents on steam railways was 65, and the number of persons injured was 1,972. The total number of persons killed in all classes of accidents incident to railways was 1,650, and the number injured was 35,429. This includes 68 persons killed and 21,582 injured in so-called "industrial accidents," which are defined as accidents not connected with train operation, but occurring to railway employees, other than trainmen, on railway premises.

PLACENTAL BACTEREMIA *

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When the fetus is stillborn or the infant dies within a few days after its birth, frequently we are unable to determine the cause of death. This fact has been emphasized in the statistical analyses recently published from two American institutions. At the Sloane Hospital for Women[1] among 10,000 consecutive confinements there were 429 stillbirths and 291 infants which died within two weeks after they were born. Reviewing an equal number of confinements at the Johns Hopkins Hospital, J. Whitridge Williams[2] found 705 cases of stillbirth and early infant death. The fetal mortality in these clinics, it would seem, is practically identical. And in both series of statistics it is instructive to find that, although careful clinical observations and postmortem examinations were made, the cause of death was not ascertained in roundly 20 per cent. of the fatal cases.

Some time ago my attention was called to a cause of fetal death not widely appreciated and one which is left out of account in the reports just quoted. Whenever membranes rupture prematurely and the labor is prolonged, especially if repeated vaginal examinations are made, bacterial invasion of the placenta—placental bacteremia—may occur. This complication constitutes a serious danger for the fetus. Its relative importance as a factor in infant mortality is difficult to estimate but its practical significance is certain.

With reference to this question I have studied five hundred consecutive confinements under my care while connected with the University of California Hospital. Including infants over 40 cm. long the mortality was 5.4 per cent. (27 cases). The infant was stillborn in 21 cases; it died on the second day in 3, on the fourth in 2, and on the ninth in 1 case. A necropsy was performed in every instance. The causes of death were as follows:

	Cases	Per Cent.
Syphilis	7	26
Birth injury	6	22
Premature separation of placenta	4	15
Placental bacteremia	3	11
Congenital heart lesion	2	7
Enlarged thymus	1	3
Toxemia pregnancy	1	3
Undetermined	3	11

A number of well-known factors combine to explain why the fetal mortality is higher in case labor is prolonged. With 62 of my patients labor lasted longer than twenty-four hours and in this group 8 fetal deaths occurred (13 per cent.). Three of the deaths were due to placental bacteremia. The mothers of these infants were not seriously ill and at the end of two weeks were discharged from the hospital in good health. Such results, it will be made clear, are not always to be expected. But before considering the experience of other observers I may summarize the histories of my cases, giving only the facts pertinent to the problem under discussion.

CASE 1.—Primipara; aged 20; generally contracted rachitic pelvis with diagonal conjugate measuring 11 cm. Presen-

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

1. Holt, L. Emmett, and Babbitt, Ellen C.: Institutional Mortality of the Newborn, THE JOURNAL A. M. A., Jan. 23, 1915, p. 287.

2. Williams, J. Whitridge: Limitations and Possibilities of Prenatal Care, THE JOURNAL A. M. A., Jan. 9, 1915, p. 95.

tation right occipitoposterior. Duration of labor twenty-eight hours: membranes ruptured six hours before delivery by midforceps. Several vaginal examinations were made but the number was not recorded. Temperature during labor, 37.8 C. (100 F.); pulse, 70. Highest puerperal temperature, 37 C. (98.6 F.); pulse, 98.

The child, 48 cm. long, weighed 3,080 gm. It was easily resuscitated. Death occurred on the third day. At necropsy the umbilical stump was dry and clean. The abdomen contained 250 c.c. of seropurulent fluid which showed streptococci in cover slips. There were subpleural ecchymoses over the left lung, but no intracranial hemorrhage and no meningitis. The brain was normal.

Sections of the placenta and umbilical cord stained with hematoxylin and eosin were normal. Sections of the placenta stained by the Gram-Weigert method showed a few streptococci just beneath the amnion in the neighborhood of the fetal blood vessels. Bacteria were not demonstrated in the cord.

Case 2.—Primipara; aged 23; normal pelvis. Presentation left occipito-anterior. Labor began with rupture of the membranes and after forty-five hours terminated normally. Six vaginal examinations were made. Temperature during labor, 38 C.; pulse, 108. Highest puerperal temperature was 38.2 C.; pulse, 110.

The child, 52 cm. long, weighed 3,540 gm. Resuscitation was difficult. Death occurred at the end of forty-eight hours. Shortly after its birth the infant bled from the mouth, and later patches of purpura appeared over the head, buttocks, scrotum and right knee. At necropsy a small blood clot was found on the parietal peritoneum adjacent to the umbilical vessels and another beneath the liver. The peritoneal cavity contained about 10 c.c. of uncoagulated blood but none was found in the intestines. There was no blood in the pleural cavity. Several hemorrhages the size of a pinhead were found at the base of each lung.

Sections of the placenta stained with hematoxylin and eosin were normal but the umbilical cord was infiltrated with leukocytes, most pronouncedly in the neighborhood of the vein. Stained by the Gram-Weigert method streptococci were demonstrated in the amniotic and chorionic connective tissue near the fetal surface of the placenta. Streptococci were also present in the cord.

Case 3.—Primipara; aged 38; normal pelvis. Presentation left occipito-anterior. Membranes ruptured when the cervix was dilated 5 cm., twenty-four hours before delivery was effected by midforceps. Temperature during labor, 37.8 C.; pulse, 106. Highest puerperal temperature, 38.5 C. (101.3 F.); pulse, 115.

The child, 50 cm. long, weighed 2,980 gm. For an hour before delivery the fetal heart sounds were not heard. The necropsy findings were negative except for a small cerebral hemorrhage beneath the left occipital lobe.

Sections of the placenta showed partial thrombosis of many of the vessels which pass over the fetal surface of the placenta. Large numbers of bacteria were demonstrated in the amnion covering the placenta and in the underlying chorionic connective tissue. Streptococci and also a short, stout bacillus, resembling the gas bacillus, were present. A few streptococci were found in the intervillous spaces but the chorionic villi were normal. A typical mixed thrombus almost completely blocked the umbilical vein. It contained streptococci as did also the wall of the vein and the surrounding Whartonian jelly. The walls of the umbilical arteries were slightly infiltrated with leukocytes but no bacteria were demonstrated there.

In all these cases organisms were demonstrated in the subamniotic connective tissue where they came in contact with the large fetal blood vessels which cross the surface of the placenta. In one instance it was possible to demonstrate bacteria in the act of penetrating the walls of these vessels. It is also noteworthy that in every case the epithelium which covers the villi was intact, the capillaries within the villi were of normal appearance, and no bacteria were found either on the surface or in the interior of the villi. Evidently the infection did not proceed from the maternal circulation and did not pass through the walls of the villi. The bacteria entered the placenta by way of the amniotic membrane. Most frequently, as in these cases, placental bacteremia depends on the infection of the amniotic fluid; and generally the latter complication occurs because the membranes rupture prematurely, labor is prolonged, and repeated vaginal examinations are made.

From a knowledge of the anatomy of pregnancy it is obvious that, at least theoretically, the infection of the amniotic fluid is possible by three routes: (1) organisms may pass from the maternal circulation across the decidua, the chorion, and the amnion; (2) they may travel from the peritoneal cavity down the fallopian tubes, or (3) they may ascend from the vagina through the cervical canal. In a series of animal experiments the progress of an infection along each of these paths has been demonstrated by Hellendall,[3] but only the third has a broad, practical significance in human pathology. It has not been established that the other routes ever play a rôle except under conditions that have been imposed experimentally. And yet, it is possible in human beings that hematogenous infection of the amniotic fluid may be the result of a maternal septicemia; and also that in case of acute inflammation of the appendix during pregnancy the responsible organisms may find their way down one of the fallopian tubes. At all events, in the cases I have observed, neither septicemia, appendicitis, nor peritonitis existed; on the other hand, ideal conditions prevailed for infection of the amniotic fluid by the vaginal route.

When the membranes have ruptured, an increased liability to infection is apparent; and some have taught that bacterial invasion of the amniotic cavity occurred while the membranes were intact. The evidence favoring the latter possibility, however, is not conclusive, as it has never been confirmed by bacteriologic examination. In the cases recorded by Lehmann, Carpentier, Brieglet, Lendanthal[4] and others, the foul smelling decomposed amniotic fluid which escaped when the membranes ruptured may have been due, as these observers suggest, to bacterial putrefaction; but in the absence of cultures it remains to be proved that the unruptured membranes are not an effectual barrier against the passage of bacteria from the vagina to the amniotic cavity.

Although under suitable conditions a great variety of pathologic bacteria may invade the amniotic fluid, the streptococcus has been the predominating organism found in cases of placental bacteremia. Frequently colon bacilli are associated with streptococci. In the case of tympanitis uteri during labor the colon bacillus was regarded as the exclusive etiologic factor until, in one instance, Krönig[5] demonstrated an obligatory anaerobic bacillus. Warnekros[6] has isolated the gas bacillus from blood cultures in several cases of placental bacteremia. And in one of my cases placental sections showed a short, stout bacillus corresponding morphologically with the *Bacillus acrogenes capsulatus*

3. Hellendall: Beitr. z. Geburtsh. u. Gynäk., 1906, x, 320.
4. Lehmann, Carpentier, Brieglet, Lendanthal, quoted by Hellendall, Note 3.
5. Krönig: Centralbl. f. Gynäk., 1894, xviii, 749; ibid., 1905, xxix, 1243.
6. Warnekros: Arch. f. Gynäk., 1913, c, 173.

though its identity was not established by means of cultures.

From the nature of the lesion in placental bacteremia, an infection within the uterus, generally limited to the amnion and the chorion and often most pronounced in the neighborhood of the large vessels passing over the fetal surface of the placenta, the associated clinical problem pertains both to the mother and to the child. Thus far, its maternal aspects have aroused the greatest interest. And this interest has been stimulated chiefly by a desire to determine whether a true uterine infection was responsible for intrapartum fever.

Glockner[7] thought the existence of an infection was unnecessary to explain intrapartum fever. Frequently in these cases the temperature becomes normal immediately after delivery, or presents only a slight temporary rise during the puerperium. Consequently, Glockner assumed pathogenic bacteria were not present, and ascribed the intrapartum symptoms to prolonged and violent uterine contractions. Winter[8] favored this view but also admitted that bacteria might be indirectly concerned. According to Winter's hypothesis the symptoms were occasionally explained by the absorption of toxins from a decomposing ovum. On the other hand, Hausen, Krönig, and Hellendall declared that intrapartum fever, like puerperal fever, depended on a bacterial invasion of the maternal tissues.

It occurred to Warnekros that this difference of opinion could be settled if cultures were made from the mother's blood in case her temperature during labor rose above 38.5 C. The procedure was adopted in 25 cases; the cultures from 18 cases were positive, from 7, negative. In 9 instances streptococci were isolated, in 3 staphylococci, and in the other positive cases colon bacilli, pseudodiphtheria bacilli, or anaerobic gas-producing bacilli; not infrequently more than one type of organism was isolated. Whenever a positive culture was obtained during labor, another was made on the day following delivery. The puerperal cultures were negative except in one instance—the case of a patient who died of a streptococcus septicemia on the third day postpartum.

In approximately 70 per cent. of the cases of intrapartum fever it was clear that a genuine, if temporary, infection of the mother existed. The cause of the fever in the other cases was uncertain. Consequently, the scope of the investigation was broadened, and sections of the placenta were stained for bacteria. In every instance, even though the blood cultures had been negative, organisms were found in the placenta. And, therefore, Warnekros concluded that intrapartum fever, unless attributable to some accidental cause, as tuberculosis, was due to an infection of the mother, often mild and temporary, and that a placental bacteremia was always demonstrable.

The character of the puerperium which will follow a febrile labor may best be predicted from the result of blood cultures taken the day after delivery. Generally, these are negative and a good prognosis is assured. On the other hand, positive cultures indicate the existence of a puerperal infection. Blood cultures at the time of labor have no prognostic value. Similarly, as a prognostic sign the degree of fever at the time of labor is unreliable, for Winckel[9] observed several patients who experienced a puerperal convalescence free from fever in spite of an intrapartum temperature above 39 C. (102.2 F.).

The puerperal morbidity in cases of intrapartum fever, an average based on the report of 944 cases by five observers, would seem to be about 63 per cent., the puerperal mortality 6.2 per cent.

RESULTS FOR THE MOTHER FOLLOWING INTRAPARTUM FEVER

	No. of Cases	Normal Puerperium Per Cent.	Slight Fever Per Cent.	Severe Fever Per Cent.	No. of Deaths
Ahlfeld[1]	62	35.5	29.8	35.5	3
Glockner[2] ...	211	62.5	15.16	22.27	13
Ihm[3]	190	58.43	25.27	13.69	8
Krönig[4]	37	21.6	.....	78.4	7
Hellendall[5] ..	44	6.54	63.63	29.54	1

1. Ztschr. f. Geburtsh. u. Gynäk., 1893, xxvii, 494.
2. Ztschr. f. Geburtsh. u. Gynäk., 1891, xxi, 409.
3. Ztschr. f. Geburtsh. u. Gynäk., 1904, lii, p. 30.
4. Centralbl. f. Gynäk., 1894, xviii, 749; ibid., 1905, xxix, 1243.
5. Beitr. z. Geburtsh. u. Gynak., 1906, x, 320.

In case of intrapartum fever the outlook is much more serious for the infant than for the mother. The fetal mortality encountered by Ihm was 18 per cent., by Hellendall 19 per cent., by Winter 35 per cent., and by Kronig 61 per cent. These statistics include cases of toxemia of pregnancy, of placenta praevia, of pelvic contraction, and of malposition of the fetus. Therefore, the death of the fetus may have been due to one of several causes, and, lacking the requisite examination, it is impossible to determine to what extent the infection of the placenta was concerned.

At present I am content to emphasize the fact that intrapartum infection must be regarded as one cause of fetal death, and also to demonstrate that the umbilical vessels may be the path of the infection. Heretofore, it has been assumed that antepartum infection of the fetus depended on its swallowing or aspirating the infected amniotic fluid. At most, Krönig has said, blood-borne infections to the fetus are limited to cases in which the mother is suffering from septicemia, as in typhoid fever, pneumonia, tuberculosis or cholera. But another possibility must be reckoned with, namely this: If the amniotic fluid is infected, the bacteria may cross the amnion and invade the placental vessels which carry blood to the fetus.

In one instance I have noted an intense infection of the subamniotic connective tissue and have demonstrated streptococci in the vessels on the fetal surface of the placenta and also in the umbilical vein. In another, streptococci were found in the placenta and in the cord, not in the lumen of the vein but in its wall. As further evidence that the cord infection proceeded from the placenta rather than the fetus no inflammatory lesion of the fetal respiratory or gastro-intestinal tract was found in any case. Various fetal organs were stained for bacteria but none were demonstrated.

It is also instructive that an examination of the placenta for bacteria occasionally serves to establish the cause of fetal death. Until this examination was made, the death of one infant which presented at necropsy a general peritonitis was attributed to imperfect nursery hygiene. Obviously, that explanation was excluded by the demonstration of streptococci in the placenta. Again, in the second case of placental bacteremia, the clinical diagnosis was hemophilia, and human blood serum was administered; the

7. Glockner: Ztschr. f. Geburtsh. u. Gynak., 1891, xxi, 386.
8. Winter: Quoted by Meyer-Ruegg in Handb. d. Geburtshülfe, ii, Part 3, p. 2375.
9. Winckel: Quoted by Kronig, Note 5.

necropsy added nothing to the clinical findings. Also, in the third case the cause of the death of the fetus was not established clinically nor by postmortem; without appropriate study of the placenta the diagnosis could not have been made.

Placental bacteremia is not always attended by the death of the fetus or the newly born infant. This would not be expected. Bacterial invasion of the amnion and the chorion does not mean that the fetal blood vessels will necessarily become involved. The invasion may advance in another direction. Furthermore, the period of time elapsing between the invasion of the amnion and the birth of the infant may be too short for the organisms to reach the blood vessels in question. Clinical evidence corroborates this view; in cases of intrapartum fever, at most, two thirds of the infants perish.

This series of cases is not large enough to justify an uncompromising estimate of the part placental bacteremia plays in infant mortality. The fact, however, that three of twenty-seven deaths were attributable to this cause shows that it must be taken seriously into account. Perhaps it explains an appreciable number of the fetal and infant deaths heretofore impossible of explanation. Therefore, it is pertinent to recall the frequency of certain phenomena which are usually associated with bacterial invasion of the fetus.

Premature rupture of the membranes was noted by Bassett[10] five hundred times in 4,141 consecutive confinements and by Dmelin[11] four hundred times in 4,000 confinements. Thus, the frequency of this accident may be estimated to be between 10 and 15 per cent. On the other hand, Winckel and Krönig regard 3 per cent. as a fair estimate for the frequency of intrapartum fever. Basing a calculation on these statistics, it appears, if the membranes rupture prematurely, bacterial invasion of the placenta occurs in every fourth or fifth case. In view of these facts the routine study of the placenta for the purpose of demonstrating bacteria should be undertaken not only when the labor is febrile but also if it is prolonged after the membranes rupture.

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10. Bassett: Ztschr. f. Geburtsh. u. Gynäk., lxxiii, 566.
11. Dmelin: Quoted by Bassett, Note 10.

Swimming-Pool Sanitation.—A valuable contribution to this subject is contained in *Public Health Reports*, Sept. 17, 1915. It is by W. A. Manheimer, Ph.D., of the Department of Bacteriology of Columbia University, and details in tabulated form the results of a bacteriologic study of the water of a number of pools under various conditions of use, without and with the use of a number of chemical disinfectants. Among the conclusions reached were that the cubic capacity of a pool affects its sanitary condition, pools of small capacity being more difficult to keep in a satisfactory condition even with the use of chemicals; the process of adding dilution water is an efficient means of reducing the bacterial content; the supervision of the plant and the class of attendance are also important factors in pool sanitation; filtration is an adequate means of clarifying the water, which is a means of preventing accidental drowning. In pools in which refiltration is not practiced the water becomes so cloudy in one day that the bottom of the pool cannot be seen; chemical disinfection with calcium hypochlorite is effective, but if added too infrequently or in too small quantity its value is largely lost. A trace of chlorin should be constantly present; the best method of keeping a pool in safe and sanitary condition is by the combined method of refiltration and chlorination.

A MODIFICATION OF THE ABDERHALDEN TEST *

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In the course of the last two years the Abderhalden reaction has been brought to the attention of the medical profession so often that it is safe to assume that the fundamental facts discovered by Abderhalden are generally known. In short, Abderhalden, as does Ehrlich, assumes that normal cells of the body are able to assimilate only those substances present in the blood as its normal constituents. The changes brought about in the composition of the blood serum by introduction of foreign substances lead to disturbances in the processes of cellular nutrition and often to cellular death. The experimental study of the phenomena of assimilation of foreign material introduced directly into the blood stream revealed a number of facts pointing to the tendency of the cells to elaborate a special mechanism, by means of which the cells are able to protect themselves in a specific manner against the injurious effects of disturbances of their normal nutrition.

According to Abderhalden, this protective mechanism consists in the formation in the cells of new and specific ferments, which directly attack the foreign material. As in the case of the antibodies of Ehrlich, these specific ferments, according to Abderhalden's conception, at a certain stage of the process, may appear detached from the cells, and be found circulating free in the blood. The presence, in the blood of animals, of such specific ferments not existing there normally, may be taken to indicate that the parenteral digestion of foreign substances is taking place in the body. According to Abderhalden and his collaborators, the presence of such specific ferments may sometimes be demonstrated in the blood of experimental animals a few hours after the parenteral introduction of foreign substances.[1]

As Abderhalden has shown, not only foreign substances introduced experimentally, or these penetrating in the tissues as a result of infection, but also autogenous substances arising in the animal body under physiologic conditions may cause the production of specific ferments as soon as such substances find their way into the blood stream. Thus for instance, he found that during pregnancy the animal body elaborates specific ferments capable of digesting placenta protein.[2] This finding led Abderhalden to propose a new method of diagnosis of pregnancy, whereby the condition of pregnancy is suspected in every case in which the blood of the individual contains specific ferments that are capable of digesting placenta tissue in vitro.[3]

A great number of investigators confirmed Abderhalden's findings, and some of them attempted to apply the method to the diagnosis of various pathologic con-

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1. Abderhalden, E.: Abwehrfermente, Ed. 4, 1914, pp. 77, 78. Heilner and Petri: München. med. Wchnschr., July 15, 1913, p. 1530.
2. Abderhalden, E.: Abwehrfermente, p. 91.
3. Abderhalden, E.: Abwehrfermente, pp. 92, 93.

ditions.[4] They also found these ferments specific to such a degree, that they were able to differentiate by this method different closely allied species of bacteria.[5]

However, in spite of the great number of most enthusiastic supporters of the specificity of this method,[6] many investigators, continuously increasing in number, have not been able to fully confirm the usefulness of the method. According to some of them the reaction is absolutely devoid of specificity,[7] and others, whereas they acknowledge its value in negative cases as definitely excluding the presence of specific ferments, deny the value of positive findings;[8] others, again, think that the ferments are only relatively specific, namely, their specificity is directed toward groups of substances, but not toward the individual members of each group.[9]

Referring to these differences in opinion of different investigators, Abderhalden repeatedly stated that those unable to repeat his experiments are undoubtedly using a faulty technic, and until they obtain the expected results, they ought not to consider themselves in possession of the knowledge of the method.[10] On the other hand, Oeller and Stephan, for instance, from their experience with the test, concluded that the reasons for the discrepancies are much deeper—they believe that the study of protective ferments has already come to the point at which "further progress is possible only if the whole mass of contradictory clinical results obtained up to date is thrown overboard, and the study of the problem is started anew."[11] These authors found that although under certain conditions of the experiment the Abderhalden method gives suggestive results, still the further systematic study is impossible until we do away with such parts of the technic of the method as are responsible for the errors in the result.

Although many authors are inclined to think that the technic of the Abderhalden test is very difficult,[12] our own experience showed us that the method is much simpler than some other serologic methods. The difficulty in obtaining more constant results, lies, as we see it, not so much in the complexity of manipulations, as in the fact that the relations of the ingredients to each other are not properly understood, and, therefore, are not properly controlled in the test.

Our experiments have shown us that although in a number of cases one obtains apparently specific results, the Abderhalden reaction does not depend on the presence in the serum of specific ferments.[13] The very fact that these ferments, according to Abderhalden, appear almost immediately on introduction of foreign material, made many authors doubt the possibility of their existence.[14] Moreover, the fact that a certain number of male serums in the hands of reliable workers give rise to dialyzable split products when combined with placenta shows that the digestive properties of serum may not be specific.

In our own experiments conducted with the view of detecting the nature of the Abderhalden reaction, we came to the conclusion that in no case is the placenta digested,[15] and that the mechanism of the reaction is entirely different from that ascribed to it by Abderhalden. Namely, we found that, as first suggested by Stephan and Hauptmann,[16] the Abderhalden test is possible only with the serums containing complement, and when complement is missing, any fresh serum is able to activate the test,[17] thus showing that at least the active principle in the digestion is not specific. Moreover, it was found that the relative specificity of the test depends not on the presence of specific ferments, but on the substances, which, like the antibodies of Ehrlich, are not active by themselves, but are responsible for the specificity of the reaction.[18] We found, further, that the active principle responsible for the appearance of the dialyzable substances is, like complement, present in every fresh serum, and possesses properties of a tryptic ferment. This ferment is normally prevented from exhibiting its digestive power by the simultaneous presence in every serum of inhibiting substances apparently colloidal in nature. These under the influence of the physiochemical changes in the medium occurring during the experiments, easily lose their property to neutralize the trypsin of the serum.[19] Such changes are most easily produced through adsorption. For instance, addition to a fresh serum of a suitable amount of any organic substratum or of substances like kaolin, starch, agar, etc.,[20] changes the degree of colloidal dispersion in the serum, and the normal trypsin is set free. Although, as we have shown,[21] if such nonspecific tryptic ferment liber-

4. In close succession a number of publications described results obtained from application of this method to the study of neoplasms. (Freund, E.: Wien. klin. Wchnschr., 1913, xviii, 730; Fried, C.: München. med. Wchnschr., 1913, i, 2782; Gambaroff: ibid., July 29, 1913, p. 1644; Lowy, Otto: A Serum Reaction as an Aid in the Diagnosis of Cancer, THE JOURNAL A. M. A., Feb. 7, 1914, p. 437; Benech, J.: Compt. rend. Soc. de biol., 1914, lxxvi, 361), asthma (Kabanow: Russk. Vrach, 1914, No. 4, abstr., Deutsch. med. Wchnschr., 1914, p. 770), syphilis (Reines: Wien. med. Wchnschr., 1914, No. 10; Mahlo: Abstr., München. med. Wchnschr., July 28, 1914, p. 1695; Fraenkel: Ibid., p. 1695; Voelkel: Ibid., No. 7, p. 349; Bornstein: Arch. f. Dermat. u. Syph., 1914, cxx), rabies (Babes and Pitulesco: Compt. rend. Soc. de biol., 1914, lxxii, 207), tetanus (Urechia and Popeia: Ibid., 1913, lxxv, 591), pellagra (Babes and Jonnesco: Ibid., 1914, lxxxvii, 171), tuberculosis (Abderhalden and Andryewsky: München. med. Wchnschr., 1913, lx, 1641. Lampe: Deutsch. med. Wchnschr., 1913, No. 3, Melikjans: Ibid., 1914, No. 27. Gompertz: Beitr. z. klin. d. Tuberk., 1914, xxx, No. 1. Fraenkel and Gompertz: Deutsch. med. Wchnschr., 1913, p. 1585. Wolf and Frank: Berl. klin. Wchnschr., 1914, p. 875), nervous diseases (Ahrens: München. med. Wchnschr., 1913, p. 1857. Beyer: Ibid., 1913, p. 2450. Ahrens: Ztschr. f. exper. Med., 1914, p. 397. Binswanger: München. med. Wchnschr., 1913, lx, No. 42. Fauser: Ibid., 1913, p. 1984; ibid., 1914, p. 126), nephritis (Kotchanef and Chingarewa: Compt. rend. Soc. de biol., 1914, lxxvi, 354), scarlet fever (Schultz and Grote: München. med. Wchnschr., 1913, p. 2510).

5. Kirchbaum and Koller: abstr., München. med. Wchnschr., June 23, 1914, p. 1415. Voelkel: Ibid., Feb. 17, 1914, p. 349.

6. Heinemann: München. med. Wchnschr., 1913, p. 915. Daunay and Ecalle: Compt. rend. Soc. de biol., 1913, lxxiv, 1190. Sabin: Presse méd., 1913, p. 1015. Mayer: München. med. Wchnschr., 1914, lxi, 67. Schiff: Ibid., 1914, lxi, 768. Tsatchenko: Deutsch. med. Wchnschr., 1914, p. 1411. Schwartz, Henry: Value of Abderhalden's Biologic Reactions to the Obstetrician and Gynecologist, THE JOURNAL A. M. A., Aug. 1, 1914, p. 371; and many others.

7. Heilner and Petri: München. med. Wchnschr., 1913, p. 1775. Krim: abstr., Deutsch. med. Wchnschr., 1914, p. 38. Michaelis and Lagermark: Berl. klin. Wchnschr., 1914, p. 364. Oeller and Stephan: München. med. Wchnschr., 1914, lxi, 12. Lichtenstein and Hage: Ibid., p. 915. Flatow: Ibid., p. 1168. Fraenkel: Deutsch. med. Wchnschr., 1914, p. 589; and many others.

8. Echols, Chester M.: Limitation of the Dialysis Method as a Practical Test for Pregnancy, THE JOURNAL A. M. A., Aug. 1, 1914, p. 370.

9. Pincussohn and Petow: Biochem. Ztschr., 1913, p. 319. Singer: München. med. Wchnschr., 1914, p. 350. Meyer, Betz and Rhymer: München. med. Wchnschr., 1914, p. 1211.

10. Abderhalden, E.: München. med. Wchnschr., 1914, p. 233.

11. Oeller and Stephan: Deutsch. med. Wchnschr., 1914, p. 1557 (Conclusions).

12. Meyer, Betz and Rhymer: Note 9. Csepai: Wien. klin. Wchnschr., 1914, No. 23.

13. Bronfenbrenner: Pennsylvania State Med. Jour., October, 1914; Biochem. Bull., 1915, p. 87.

14. De Waele: Ztschr. f. Immunitatsforsch., Orig., 1914, xxii, 170. Heilner and Petri, München. med. Wchnschr., 1913, p. 1530. Bronfenbrenner: Proc. Soc. Exper. Biol. and Med., 1914, p. 3.

15. Bronfenbrenner: Proc. Soc. Exper. Biol. and Med., 1914, p. 7.

16. Stephan: München med. Wchnschr., 1914, p. 801. Hauptmann: Ibid., p. 1167. Benech: Compt. rend. Soc. de biol., 1914, lxxxi, 361. Bronfenbrenner: Jour. Exper. Med., 1915, xxi, 221.

17. Abderhalden and Grigorescue: Med Klin., 1914, No. 17.

18. Bronfenbrenner: Proc. Soc. Exper. Biol. and Med., 1914, p. 4.

19. Bronfenbrenner: Jour. Exper. Med., 1915, p. 221.

20. This phenomenon was noticed also by previous observers (Plaut: München. med. Wchnschr., 1914, p. 238. Kjargaard: Ztschr. f. Immunitatsforsch., xxii, 31. Herzfeld: Biochem. Ztschr., 1914, p. 1. Peiper: Deutsch. med. Wchnschr., 1914, xl, 1467. Flatow: München. med. Wchnschr., 1914, lxi, 1168).

21. Bronfenbrenner and Scott: Proc. Soc. Exper. Biol. and Med., 1915, p. 137.

ated from the serum is able to digest natural protein (bacteria, placenta cells, etc.), it is, however, absolutely unable to attack a denatured coagulated substratum. It is thus that we concluded that in the Abderhalden reaction the dialyzable split products originate not from the boiled substratum, but from the serum itself.[18, 19]

Experiments show that the number of positive reactions, obtained with specific serums, is much higher than that obtained with normal, although the substratum in the Abderhalden reaction is not digested, and the dialyzable substances originate from autodigestion of the serum under examination. Many authors who ascribe the digestion in Abderhalden reaction to nonspecific ferments, have suggested that the apparent specificity of the test must be due to the fact that during pregnancy as well as in different pathologic conditions, the serum contains a larger quantity of proteolytic enzyme than normally, and thus gives a higher percentage of positive reactions.[22]

Our own experiments, however, suggest another explanation. Whereas an excess of substratum is able to set to autodigestion any fresh serum, in an absolutely nonspecific manner, a suitable amount of substratum as prescribed by Abderhalden will very often react only with specific serums. It is thus possible that the reaction is specific when certain definite quantitative relations are maintained between the substratum and the serum; it is certain, however, that an excess of substratum will exert a nonspecific adsorption on any fresh normal serum. The experiments performed with the view of studying this possibility showed that boiled substratum, similarly to any antigen, is able to extract from the specific serum its antibody, and as a result this substratum is so changed that it is now able to adsorb from the fresh serum its antitrypsin and thus set free trypsin (Table 1).

The experiments reported in Table 1 thus show that within certain quantitative limits the Abderhalden reaction remains specific, but if the substratum is taken in excess, it may act mechanically and the reaction becomes nonspecific.[23]

It is thus apparent that the Abderhalden reaction consists of two consecutive phases. In the first phase of the reaction the antigen of the substratum unites with the antibody of the specific serum, and in the second phase such a "sensitized substratum" adsorbs antitrypsin and permits autodigestion of the serum. By preventing fresh serum from autodigestion immediately following the sensitization of the substances we actually separated the two phases.[24].

Using the known property of antibody to unite with antigen at low temperature, which prevents the activity of the complement and also excludes the activity of the proteolytic ferment, we found that the thimble containing placenta and pregnant serum did not give up dialyzable substances into the surrounding medium.

TABLE 1.—CHANGE IN SUBSTRATUM CAUSING IT TO SET TRYPSIN FREE ACCORDING TO TEST

3 c.c. of specific serum with 1 gr. of boiled substratum in glass tube on ice for sixteen hours.				
Centrifuged				
Serum separated and placed in a thimble	Substratum (sensitized?) washed and placed in thimble with 3 c.c. of salt solution			
On ice for sixteen hours				
Ninhydrin test —	Ninhydrin test —			
Transferred to 37 C. for sixteen hours				
Ninhydrin test +	Ninhydrin test —			
	Same substratum (sensitized?) separated in two parts			
	A	B	C	D
	0.5 gm. substratum with 1.5 c.c. normal serum placed in a thimble at 37 C. for sixteen hours	0.5 gm. substratum with 1.5 c.c. normal serum placed in a glass tube on ice for sixteen hours	0.5 gm. fresh substratum with 1.5 c.c. normal serum placed in a thimble at 37 C. for sixteen hours	0.5 gm. fresh substratum with 1.5 c.c. normal serum placed in a glass tube on ice for sixteen hours
	Ninhydrin test +	Centrifuged	Ninhydrin test —	Centrifuged
		Substratum in a thimble with 3 c.c. of salt solution at 37 C. for sixteen hours / Serum in a thimble at 37 C. for sixteen hours		Substratum in a thimble with 3 c.c. of salt solution at 37 C. for sixteen hours / Serum in a thimble at 37 C. for sixteen hours
		Ninhydrin test — / Ninhydrin test +		Ninhydrin test — / Ninhydrin test —

Substratum is allowed to remain in contact with specific serum in a centrifuge tube on ice for sixteen hours, as before. Then the contents of the tube are centrifuged and the substratum is separated from the serum. The substratum is now washed, suspended in salt solution, and placed in a dialyzing thimble, and the serum, separated from it, is placed in another thimble and returned to the ice box for sixteen hours. As the table shows, no dialyzable substances appeared in either case. If, however, both thimbles were now transferred to 37 C., the serum gives off products of self-digestion, while the substratum does not show even traces of it. However, according to the hypothesis suggested, such a substratum must have acquired the property of removing from the serum the substances inhibiting the activity of the ferment in the serum. To ascertain if this was the case, the same substratum was separated from salt solution and placed in contact with fresh normal serum in a new thimble (Table 1, *A*). Whereas the normal serum used in this experiment, when placed in contact with fresh substratum, gave a negative Abderhalden test (Table 1, *C*), the same serum, being placed in contact with the substratum previously treated with specific serum, and from which all traces of the serum were washed away, gave a distinct ninhydrin reaction (Table 1, *A*).

22. Solowjew: Zentralbl. f. Gynäk., 1914, No. 17. Kjargaard, Ztschr. f. Immunitätsforsch., 1914, xxii, 31. Flatow: München. med. Wchnschr., 1914, p. 1399.

23. It is important to remember that the suitable amount of substratum, acting specifically with one serum may be unsuitable for another serum, and here is the main weakness of the method.

24. Bronfenbrenner, Mitchell and Schlesinger: Biochem. Bull., April, 1914, p. 386.

We did find, however, that the placenta, as well as the serum, underwent changes very similar to those we should have expected if we had used a hemolytic amboceptor and corresponding erythrocytes, namely, placenta protein had adsorbed the antibody from the serum and the serum lost all its specific properties. The summary in Table 2 gives the essentials of our results.

These findings are not only of theoretic importance, inasmuch as they furnish further proof of the similarity of the phenomenon described by Abderhalden to immunity reactions in general, but are also of practical value. Those making routine examinations by the Abderhalden method, know that the blood of a patient taken under certain conditions may contain an amount of amino-acids sufficient to mask the specific reactions,[25] as for instance, when the patient has high temperature, when there is pus formation, or if the patient has recently partaken of food. Whereas, the last mentioned factor can be regulated with but little inconvenience to the patient, the blood being taken before breakfast, it is impossible to obviate the complications in other cases.[26] In such instances where

TABLE 2.—ESSENTIALS OF AUTHORS' RESULTS IN TESTS WITH PLACENTA

1.5 c.c. specific serum with 0.5 gm. boiled substratum	
In glass tube on ice sixteen hours	
Centrifuged	
Substratum (sensitized?) with 1.5 c.c. normal serum	Serum (exhausted?) with 0.5 gm. fresh substratum
In thimble at 37 C. for sixteen hours	In glass tube on ice for sixteen hours
Ninhydrin test +	Centrifuged
	Substratum (sensitized?) with 1.5 c.c. normal serum
	In thimble at 37 C. for sixteen hours
	Ninhydrin test —

the serum itself contains dialyzable ninhydrin reactive substances, the difference in the intensity of the reaction with ninhydrin in the control tube, and in the tube containing substratum as well as serum, furnishes the basis for diagnosis, but undoubtedly this may be a source of errors.[27] A modification was offered therefore, by Schlimpert,[28] who removes this source of error by subjecting the serum of the patient to dialysis prior to application of the test proper, using subsequently such serum deprived of its dialyzable material for the digestion with placenta.

Our own study suggests another possible modification of the procedure of Abderhalden which would take advantage of the property of the substratum to become sensitized by the specific serum, so as later to give up dialyzable substances when placed in contact with any fresh human or animal serum. Such a method would permit the examination of serum taken at any time, no matter what the condition of the patient might be. The procedure is the following: After remaining over night in contact with suspected serum in the ice box, placenta (or any other substratum as the case may be) is centrifuged, washed with water to remove any serum which may adhere to it, and placed in a new thimble with any fresh serum that happens to be on hand. The best for this purpose is serum from a guinea-pig kept without food long enough (from six to eight hours) to free its blood from dialyzable ninhydrin reactive substances. It is necessary of course to take the additional precaution in examining for pregnancy, of using male guinea-pig serum, since fresh serum from a female guinea-pig which may happen to be pregnant may give a positive reaction when combined with placenta in the test, and this may cause grave error.

25. Abderhalden: München. med. Wchnschr., Feb. 24, 1914, p. 401; Abwehrfermente, p. 257. Lange: Berl. klin. Wchnschr., 1914, p. 785.
26. The presence of dialyzable material in the fluid in which the specific ferments are looked for, is especially important in the examination of urine, in which there is always a certain amount of such substances present.
27. Bisgaard and Korsbjerg: Deutsch. med. Wchnschr., 1914, p. 1367. Abderhalden: Abwehrfermente, p. 289.
28. Schlimpert and Issel: München. med. Wchnschr., 1913, lx, 1758. Borchownik: Ztschr. f. Gynäk., 1913, p. 1226. Abderhalden: Abwehrfermente, p. 291. Abderhalden and Wildermuth: Munchen. med. Wchnschr., 1914, p. 862.

CONCLUSIONS

Abderhalden tests depend on the presence in the serum of specific substances which are not of a fermentive nature.

The substratum is not digested during the test.

Dialyzable split products originate from the serum as a result of its autodigestion, and not from the substratum.

Analysis of the test shows that it consists of two phases, and this gives a basis for a useful modification of the method.

PANCREATIC FERMENT DETERMINATION IN PULMONARY TUBERCULOSIS *

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Much attention has been given to the diet of the tuberculous. Quality and daily quantity have received consideration. Digestive disturbances, as expressed by anorexia, vomiting, dyspepsia (gastric distress), intestinal indigestion and diarrhea have long been recognized as forming parts of the general picture in tuberculosis.

In the absence of gross signs of digestive derangement, it is not unusual to see a patient eat well but fail to gain in weight. It is common to see a tuberculous patient refuse all food, especially when the system is under the influence of toxins; this may be in the early febrile period as well as in the terminal stage.

Again, we see patients with good appetites and high temperatures — far advanced patients, with no appetites and low temperatures.

Observing over 200 cases, we found that, as is well known, our patients preferred vegetables and starches; that they consumed foods of these types much in excess of body needs and their ability to digest, and that starch was passed in the feces, chemically unchanged — not alone in recognizable particles as, for example, potato, but also in the fecal mass, to be

* Read before the National Association for the Study and Prevention of Tuberculosis, Seattle, June 16, 1915.

determined only by chemical test. In other cases, practically undigested meat was recovered in the stools of poor eaters as well as in those of hearty eaters.

We also noted frequent stomach and bowel disorders in these cases. None of our patients has ever been urged to eat.

It soon became evident that actual digestive aberration was a factor in the problem, especially after a perusal of Permin's table,[1] which shows anacidity and subacidity in the consumptive as follows:

First stage, 23 per cent. of cases.
Second stage, 34 per cent. of cases.
Third stage, 47 per cent. of cases.
Terminal stage, 75 per cent. of cases.

As many of the cases presented no demonstrable signs of gastric origin, however, we began the closer examination of the feces with a view to study of the pancreatic secretions, amylopsin and trypsin.

Our first series of cases consisted of twenty-four moderately advanced and incipient cases and 139 far advanced cases. Among the latter were some terminal cases. Trypsin was determined by the Fuld-Gross method, amylopsin by the Wohlgemuth method, preceded by calomel and Seidlitz catharsis. The second or third stool was taken for examination. No attempt was made in this series to estimate or control the intake of foods. This comes later.

The Fuld-Gross trypsin determination method depends on the fact that casein, undigested, is precipitated by acetic alcohol, while digested casein is not so changed. The estimation is made in units, one unit representing the ability of 1 c.c. stool filtrate to transform (or digest) 1 c.c. of starch or casein solution.

Example: If a tube containing 1 c.c. of 1:1,000 fecal dilution is the greatest dilution which can digest 5 c.c. starch or casein solution, then 1 c.c. of undiluted fecal filtrate would be able to digest 5,000 c.c. starch or casein solution. This represents 5,000 units. The average normal reading is from 500 to 1,000.

To make the test, fecal solutions of 1:10, 1:100 and 1:1,000 are made and poured into nine test tubes as follows: First three tubes: 1:10 solution, 2, 1 and 0.5 c.c. starch solution 1 per cent., or casein solution 1:1,000. Second three tubes: 1:100 solution, 2, 1 and 0.5 c.c. Third three tubes: 1:1,000 solution, 2, 1 and 0.5 c.c. To each tube are added 5 c.c. of 1 per cent. soluble starch solution or 1:1,000 casein solution, as the case may be. The tube showing digestion, that is, no reaction, by the weakest fecal solution after twenty-four hours' incubation, is taken as the index of digestion. The casein reagent is, as previously indicated, acetic alcohol (1 per cent. acetic acid may be used); the starch reagent is Lugol's solution.

A large number of the cases examined showed no free amylopsin. This does not mean that no amylopsin had been secreted, but that all secreted amylopsin had been neutralized by the starch excess (Cases 4, 6, 7, 8 and 9). We should, therefore, disregard zero amylopsin readings until we estimate the starch intake. Some cases which showed amylopsin from 25 to 50 had almost no intake of food, and hence the reading possesed no value (Cases 2 and 8). More work remains to be done on amylopsin in this connection.

Trypsin indexes are much higher and seem to possess a much greater importance. Relatively few trypsin zero readings were taken but, where present, often took on a grave significance. Again, as starch excess in diet has its effect on amylopsin determination, so has protein excess a neutralizing influence on the trypsin index.

Patients with anorexia and diarrhea had high trypsin readings. As we see it, there was no neutralization of the small amount of trypsin secreted (Case 2). Patients having good appetites and weight gains usually had high or increasing trypsin readings (Cases 6 and 7). High trypsin readings are seen in terminal cases. Here the amount of trypsin is small, but it remains free in the feces (Case 1).

Some patients with low initial trypsin indexes were put at rest, and kept on liquids or light diet until the appetite returned. Directly improvement in symptoms appeared, increase in trypsin occurred (Case 6). Following out the rest idea, trypsin indexes were taken after pneumothorax. They were always found to be higher (Cases 3, 7 and 9).

We now took a second series of over sixty cases and controlled the protein intake. It was discovered that, while under general diet, patients would show a high trypsin reading, after definite amounts of meat and eggs had been given, as 100, 250 or 300 gm., the index rapidly dropped. The explanation for this is that, on "general diet," the patient avoided his protein, and hence his high trypsin index. On graded protein diet he neutralized, even with small amounts, his trypsin. The results often showed almost an atrypsia (Case 4).

In one case with anorexia, the trypsin index was low, 100. Amylopsin, however, was 700. Protein was stopped, and amylaceous diet ordered. Improvement was marked and, afterward, accelerated by a pneumothorax. Incidentally we present readings on one case of diabetes with tuberculosis (Case 5).

We have also examined salivas, but the results gained are so variable as to preclude, for the present, any codification.

PROTOCOLS

The protocols show trypsin and amylopsin to be reduced in the tuberculous under influence of toxins. In favorable cases, disappearance of toxin is accompanied by increase of trypsin. Amylopsin is less frequently found because of the excess of starch found in the feces of the tuberculous; the ferment is neutralized by this excess. Trypsin indexes may be large in presence of anorexia and gastro-intestinal complications by lack of protein neutralization; also, because of actual improvement. Constantly low trypsin index is present in failing cases. Rising index with good appetite is favorable.

Case 1.—Frida S. Far advanced.

Oct. 30, 1914, amylopsin, 10,000; no trypsin demonstrable. Absolute anorexia. Death. No food intake, and hence no neutralization of ferments. Therefore, high amylopsin reading.

Case 2.—Percy K. Terminal.

Oct. 25, 1914, amylopsin, 100; trypsin, 500. Diarrhea (tuberculous).

Dec. 31, 1914, amylopsin, 25; trypsin, 10,000. Death.

Diet was fluid, chiefly; some starch, no protein, hence high trypsin readings, due to non-neutralization.

Case 3.—May S. Far advanced.

May 30, 1914, amylopsin, 700; trypsin, 100. Weight, 118½. Anorexia.

July 25, 1914, artificial pneumothorax. Weight 118¾.

Oct. 15, 1914, amylopsin, 25; trypsin, 5,000. Weight, 129¼.

Oct. 29, 1914, amylopsin, 50; trypsin, 10,000. Weight 135. Convalescent.

1. Permin: Internat. Beitr. z. Path. u. Therap. d. Ernährungsstörungen, 1910.

Intake, starches, no protein. After artificial pneumothorax, appetite for meat increased, weight increased, trypsin increased. Here, lung collapse reduced toxemia, and thus freed the digestive system from the influence of infection.

CASE 4.—Margaret S. Far advanced.

March 2, 1915, amylopsin, 100; trypsin, 100. Weight, 93¼.
March 5, 1915, pneumothorax (bilateral and extensive).
April 15, 1915, amylopsin, 0; trypsin, 5,000; general diet.
April 17, 1915, amylopsin, 0; trypsin, 100; 100 gm. protein.
April 19, 1915, amylopsin, 0; trypsin, 25; 250 gm. protein.
April 21, 1915, amylopsin, 0; trypsin, 0; 300 gm. protein. Weight, 89.

Losing ground; daily fever.

This was a bilateral, febrile case; appetite fair, worse lung collapsed to reduce septic absorption; fever dropped somewhat, cough and sputum ceased. April 15, the determinations were made on a general diet, which was chiefly starch; very little protein. In quantitative test, 100 gm. protein reduced the trypsin reading to 100 units, 250 gm. to 25 units, while 300 gm. entirely neutralized the secreted trypsin. Patient losing ground; febrile.

CASE 5.—William S. Far advanced. Diabetes with tuberculosis. Protein diet.

Oct. 17, 1914, amylopsin, 50; trypsin, 0; wasting.

Starches given; weight gain at once. General improvement until influenza, bronchopneumonia, death.

Jan. 12, 1915, amylopsin, 0; trypsin, 100. Mixed diet. Death.

CASE 6.—Hannah S. Far advanced. Weight on admission, Dec. 1, 1914, 107¾. No trypsin. Bed rest one month.

Dec. 12, 1914, amylopsin, 100; trypsin, 0.
Jan. 7, 1915, amylopsin, 0; trypsin, 100. Weight, 119 (a gain of 11 pounds); appetite better.
Jan. 13, 1915, pneumothorax. Trypsin index steadily rose after this.
Feb. 5, 1915, amylopsin, 0; trypsin, 0. Weight, 120. Appetite good.
March 3, 1915, amylopsin, 0; trypsin, 250. Weight, 122.
April 24, 1915, amylopsin, 100; trypsin, 1,000; 100 gm. protein.
April 26, 1915, amylopsin, 0; trypsin, 5,000; 250 gm. protein.
April 28, 1915, amylopsin, 0; trypsin, 10,000; 300 gm. protein.

General condition excellent.

CASE 7.—Howard C. Far advanced. Weight, 122. Fever. Anorexia.

Jan. 5, 1915, amylopsin, 0; trypsin, 1,000. Weight, 117. Gastric distress.
March 22, 1915, amylopsin, 0; trypsin, 100. Weight, 116¾. No fever.
April 23, 1915, pneumothorax. Weight, 116¾. Fever.
May 1, 1915, amylopsin, 0; trypsin, 250. Weight, 117. General diet.
May 2, 1915, amylopsin, 0; trypsin, 10,000; 100 gm. protein.
May 3, 1915, amylopsin, 0; trypsin, 250; 250 gm. protein.
May 5, 1915, amylopsin, 0; trypsin, 1,000; 300 gm. protein.
No fever since pneumothorax. Weight, 125. Appetite good.

This patient was wasted, febrile and dyspeptic. Four months of rest in bed led to little improvement. Then pneumothorax on the worse lung was followed by almost instant change for the better; gastric symptoms disappeared. Trypsin index, May 1, was 250 units. May 2, the protein diet was reduced to 100 gm., resulting in a trypsin index of 10,000, with 300 gm. protein. May 5, trypsin was 1,000 units, or double the normal.

CASE 8.—Hugh C. Far advanced.

Nov. 14, 1914, amylopsin, 25; trypsin, 50.
Jan. 5, 1915, amylopsin, 0; trypsin, 25.
March 6, 1915, amylopsin, 0; trypsin, 50. Bedfast.

CASE 9.—Hannah P. Far advanced.

Nov. 20, 1914, amylopsin, 100; trypsin, 250. Weight, 136¾.
Dec. 23, 1914, amylopsin, 0; trypsin, 250. Weight, 137¼.
Feb. 1, 1915, amylopsin, 0; trypsin, 50. Weight, 134¼.
Feb. 19, 1915, pneumothorax.
March 6, 1915, amylopsin, 0; trypsin, 0. Weight, 135. Invalid.

Cases 8 and 9 both show low trypsin indexes. Both are far advanced. Both have extensive lung involvement. Patient 8 has been for many months confined to bed. Patient 9 has had fever from time to time, and is now an invalid.

These constantly low trypsin readings are the rule in far advanced cases not presenting any gastric or intestinal disturbance.

CASE 10.—Vivian K. Incipient. Weight, 106.

Jan. 23, 1915, amylopsin, 0; trypsin, 0. Weight, 108.
Feb. 20, 1915, amylopsin, 0; trypsin, 250. Weight, 110½.

CASE 11.—Violet I. Incipient.

Feb. 10, 1915, amylopsin, 0; trypsin, 0. Stomach pain after eating.
March 10, 1915, amylopsin, 50; trypsin, 25. Weight, 132.
May 20, 1915, weight, 130.

Generally better. Eats well.

Cases 10 and 11 are both closed cases, with poor appetite and poor digestion; prolonged bed rest brought improvement in both.

CONCLUSIONS

1. Pancreatic secretions are seriously diminished by toxins of tuberculosis, in any stage.
2. Rest (bed rest or pneumothorax), by reducing the production of toxins, aids in the return to a normal of these pancreatic secretions.
3. Persistently low trypsin readings are prognostically bad.
4. Low amylopsin values are of lesser prognostic importance.
5. All interpretations of indexes must be made with due consideration for anorexia, overeating and diarrhea.

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THE USE OF A LOAN COLLECTION AND PHOTOMICROGRAPHS

IN THE TEACHING OF PATHOLOGY TO STUDENTS OF MEDICINE *

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Perhaps one of the most obvious defects in the usual method of teaching pathology lies in the restrictions which are imposed on the student. Too often the method is such that all he can do is to memorize certain statements of the textbooks and instructors, and to fix in his mind the appearance of certain slides rather than to read the cell changes going on in the tissues and thereby gain a plastic living conception of the processes at work in the specimen being studied.

It is generally recognized that the method rather than any particular content is the essence of scientific discipline. As Oertel[1] says:

"Medical education is primarily directed toward the development of the powers of observation and of a scientific method of thinking." One of the chief problems, therefore, in offering a course in pathology is to present it so that the student may be able to visualize the processes and at the same time keep the theoretical explanations separate from established facts and from

* From the Department of Pathology and Bacteriology of the Ohio State University, College of Medicine.

1. Oertel, Horst: The Anatomic Histological Processes of Bright's Disease, Philadelphia, 1910, p. vii.

his own observations. This must be done with minimum loss of time and energy. The time which can be allowed pathology in the medical curriculum is, at best, altogether too short. Every minute must be used, therefore, with the greatest degree of efficiency.

It is the purpose of this paper to give an account of the method in use in the laboratory of pathology at the Ohio State University, College of Medicine, in the course offered to second-year students of medicine. By the use of a loan collection and photomicrographs, a solution has been reached, to a certain extent, at least, for the problems outlined above.

Formerly much time was consumed in the mounting and staining of sections. This was cut down somewhat by staining the sections before handing them out to the class. The giving out of sections to all the members of a class each year necessitates the use of some rather indifferent material. For, as Dr. Mallory[2] says, "It requires patience often extending over many years to collect the tissues most suitable for study and teaching purposes." If this is true in the larger medical centers, it is the more applicable elsewhere. Further, the time consumed in the preparation and sketching of sections limits very decidedly the amount of work which can be covered in the time allowed to pathology in the medical curriculum.

Experience has taught us to agree with Drs. Steenland and Weiskotten[3] that much valuable time may be saved and much better preparations can be presented by the use of a loan collection. On the introduction of such a collection, we were able to increase the number of slides studied over 50 per cent. This, therefore, not only gives an opportunity to present slides typical of the various lesions which could not be introduced into the course before on account of a lack of time, but also allows the introduction of more stages in the development of the lesions than could be taken up with the student under the previous method. In this way the lesions can be traced in their development from the simplest to the most complex. The presentation in this way of the subject in its order of sequence gives the student training in the analysis of biologic problems. This training will stand him in good stead later in the study of clinical cases in which he will meet the same consequents and their causal antecedents. The use of this method affords the student a larger experience and, what is more important, it presents to him more of the evidence on which conceptions of pathologic processes have been built in the past. In this way he gains a sense of the reality of his own conceptions. The subject of pathology becomes something more than a series of dry facts to be memorized. It becomes a living process.

It may seem that this works a hardship on the student by depriving him of his collection of pathologic sections, but the man who will really need a personal collection after the course is finished is the man who is especially interested in the subject. If the student "goes in for pathology," he must do more work than is covered in the regular courses of the medical curriculum. In that case the advanced work will give him ample opportunity to make his own collection, and a collection made in this way will have far more value to him than one which has been prepared for him.

The sketching of a microscopic preparation is very apt to become a mechanical process unless each student is given a great deal of painstaking, personal attention, and at best it consumes much time. In our laboratory, this time has been utilized in another way and with better results for our classes. As stated before, photomicrographs have been made of the important areas in each section. Each student in the last four classes taking the work has been given a set of these photographs to be pasted in his laboratory notebook.

In making these photomicrographs, the degree of magnification has been determined for each section. Where it is advisable to show the cellular elements out of which the lesion is built, a high dry or 1.9-mm. oil immersion lens is used; where it would appear better to orient the student first and then allow him to work out the cytology for himself, a 16-mm. lens is employed, and the fields to be given special attention are marked on the photograph. Even with the higher magnifications, it is of advantage to have the important areas marked in such a way that the student may locate them readily and indicate them specifically in his notes.

The method of conducting the class in the laboratory is to give out the numbers of the slides to be studied (the organ or injurious agent whose reaction is to be considered having been previously assigned). After the section, together with the photograph and the text has been studied by the class, an informal quiz is given. Various members of the class are called on to give their interpretation of the processes under consideration, and a description of the areas or cellular elements which are marked on the photograph. The remainder of the class follow the progress of the student being quizzed by observing their own sections, photographs and notes, making such corrections in the latter as they deem necessary. After the quiz is over, the demonstrators pass around the class in an endeavor to clear up such obscure points as may be necessary for the individual student. Frequent slide reviews are given in which "unknown" sections are used. Free access is allowed to textbooks, notes and other references. Often the gross specimen or an abstract of the case record or both are given out with the sections. The student is required to write his description and interpretation of the cases under consideration. The papers are then read and discussed with the class.

By this method, the student has most of his time for study and the correlation of the conditions observed in his specimens. Another advantage found in the use of the photomicrographs is that in the recitation definite objects are under consideration, and the discussion can be limited to an accurate description which every one can readily follow.

By this method, we have been able to increase the amount of work covered about 60 per cent., or about 110 per cent. over that which was covered before the introduction of the loan collection and photomicrographs.

The saving of time in this way allows not only for introduction of various experimental demonstrations fashioned after the suggestion of Professor Pearce,[4] but also for the exhibition of many more gross specimens illustrating the anatomic lesions at the same time that the histologic changes are being studied. It also

2. Mallory, Frank B.: The Principles of Pathologic Histology, Philadelphia, 1914, p. i.

3. Steenland, H. S., and Weiskotten, H. G.: The Histologic Loan Collection and Relieving the Curriculum, THE JOURNAL A. M. A., Jan. 10, 1914, p. 125.

4. Pearce, Richard M.: The Teaching of Experimental Pathology and Pathological Physiology to Large Classes, Bull. Johns Hopkins Hosp., 1912, xxiii, 170.

permits of more frequent slide reviews, which are of great value in stimulating the students to make more careful observations.

The laboratory notebooks obtained by this method are in every way superior to the ones which had been obtained formerly. At the end of his course, the student possesses a manual in which the photomicrographs have been neatly mounted, beneath which there is a brief but careful description of the lesion pictured, together with an abstract of the textbooks and the lectures. Such a manual possesses considerable value to the student as a work of reference. This method, used as a routine in the laboratory, has met and overcome several of the objections usually raised to the course in pathology. It has secured greater application on the part of the students during the laboratory periods, a greater amount of outside reading, more concise and accurate descriptions in the notebooks, and increased efficiency in the slide reviews.

No doubt there is a valuable training to be derived from the sketching of histologic preparations by the student, but we are convinced that the sacrifice of time is too great for its employment in the regular course in pathology offered to second-year students of medicine. In those courses in which accurate observation of fixed morphologic structures is the important thing, as it is in normal histology, sketching should be employed; but in pathology it is more important that the student should develop the ability to give an accurate word picture, and still more important that he should be trained to visualize the changes taking place so that they become a living progressive process to him.

The labor and expense attached to such a method are not excessive. After the negatives are made, the prints may be done by a professional photographer, who can be induced to do large lots at a very reasonable rate. The photographs can be sold to the student at cost, and the price will not exceed that of laboratory books in the other branches. The cost can still further be reduced, we have found, by the use of engravings made from the photomicrographs.

Students, of course, are given the privilege of making a collection of slides for themselves, and it has so chanced that with each succeeding class trained by this method, more men are preparing their own collections. Only those men in whom a real interest for pathology has been aroused avail themselves of this opportunity.

SUMMARY

The use of the loan collection and photomicrographs in the teaching of pathologic histology possesses the following advantages:

1. It compels the student to write concise and accurate descriptions of the specific cellular elements and of the lesions which they build up.

2. It allows the discussion or quiz to be followed in detail with much greater ease.

3. It gives time for the introduction of more experimental demonstrations.

4. It permits of closer correlation between the gross and the histologic pathology.

5. It enhances the value of the notebook.

6. Most important of all, it opens a greater opportunity for the student of medicine to do some thinking for himself.

ORBITOPALPEBRAL EMPHYSEMA CAUSED BY PERFORATION OF A DENTAL CANAL

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Orbitopalpebral emphysema is not a very common condition, but when it is found it is always of traumatic origin. Ordinarily it is the result of a fracture of the nasal, lacrimal or ethmoidal bones. It may, however, occasionally be caused by the dentist during the process of drilling the dental canal, as can be seen from the case which I here report. The condition is practically harmless and requires no treatment beyond a pressure bandage.

The diagnosis of the condition is comparatively easy. There is a sudden swelling of the lid and adjacent tissues, with no signs of inflammation, no redness, no pain. The swelling does not pit on pressure, but quickly rebounds, and there is a peculiar crackling sensation felt by the palpating finger, which results from the movement of air bubbles under the fingers. There is no exophthalmos in this variety of emphysema. Exophthalmos is present in emphysema of the orbit, but not in emphysema of the lid. Properly speaking, this form of emphysema should be termed "palpebrofacial," for usually the face is involved in the edema in addition to the lids. None of the textbooks mention mechanical perforation of the dental canal as a possible cause of emphysema, therefore this case should be placed on record.

Miss L. came to me accompanied by her dentist, who gave me the following history. While drilling on the mesial root of the right upper first bicuspid tooth he felt as if his burr entered a vacuum. He then tried to explore the region with a broach, which went in for a considerable distance. During this operation the patient felt no pain except some pressure sensation, which she attributed to the pressure of the dentist's thumb on her cheek. When the broach was withdrawn her lids suddenly began to swell, so much so that the right eye was entirely covered by the swelling of the upper and lower lids. The swelling spread all the way down the face and even the neck. I saw the patient about an hour and a half after, and found the face swollen, the lids, very markedly edematous, covering the right eye. The lids, however, could easily be separated. The asymmetry of the face as a result of the unilateral swelling gave the patient a hideous appearance. The skin of the lids and face was not tense and had no signs of inflammation. There was no pitting on pressure as the skin quickly rebounded. There was, however, marked crepitation under the finger's touch all over the lids and face and even down the region of the neck. Sneezing or blowing the nose had no influence on the swelling. My diagnosis was of course clear and easy: Palpebral emphysema caused by perforation of the dental canal into the antrum of Highmore and the upper bony roof of the antrum, through which the air must have gone into the subcutaneous tissues. This condition could easily be differentiated from a cellulitis by the sudden onset and the absence of inflammatory symptoms, such as redness and pain, and, of course, by the crackling sensation under the finger.

I applied a pressure bandage and the next day the swelling was considerably less. On the fifth day, while the swelling was practically all down, there was still present a slight crackling sensation indicating that not all the air had been absorbed. Seven days elapsed before all the symptoms disappeared. No other treatment was given except the pressure bandage for two days.

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AN UNUSUAL TYPE OF GROSS CARDIAC ARRHYTHMIA*

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Gross irregularity of the pulse signifies, as a rule, that fibrillation of the auricles is present with the resultant ventricular arrhythmia. Rarely a gross sinus arrhythmia not dependent on respiration or an auricular flutter with irregular grades of heart-block may produce a condition of the pulse simulating that of auricular fibrillation.

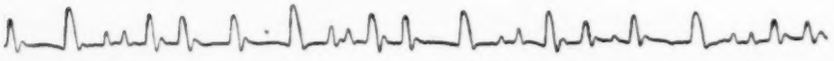

Fig. 1.—Radial pulse tracing showing marked arrhythmia. Time interval, 0.2 second.

In the case here described, an unusual cause of the gross arrhythmia was found, consisting of a curious aggregation of ectopic contractions arising from at least three different points in the ventricles, with now and then an aberrant beat of supraventricular origin slipping in (Figs. 1 and 2). The time intervals between the ventricular complexes are shown below the electrocardiogram. On several occasions while the patient was under observation at the Massachusetts General Hospital this arrhythmia was found. At other times there occurred a bigeminy due to ventricular premature beats alternating with the beats of supraventricular origin (Fig. 3). Rarely a short run of beats of normal rhythm occurred, and on such occasions pulsus alternans was found to be present. Electrocardiograms showed the existence of defective conduction in the right branch of the atrioventricular bundle.

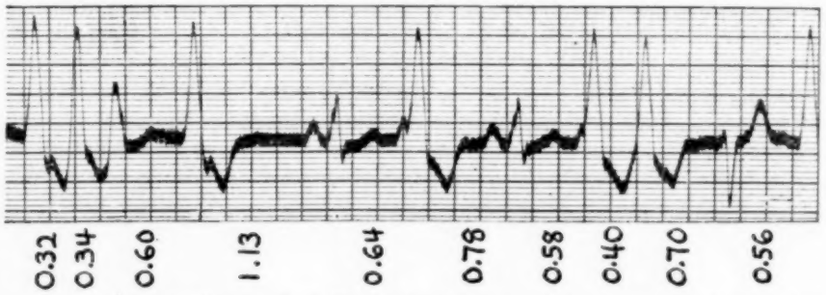

Fig. 2.—Electrocardiogram, Lead II, showing eleven ventricular complexes, of which nine are ectopic and only two produced by the cardiac impulse arising in the auricle. These two beats of normal rhythm are aberrant, that is, distorted, as the result of a damaged atrioventricular conducting system. Below the electrocardiogram there are recorded the measurements in fractions of a second of the intervals between the ventricular complexes. Abscissa, 0.2 second; ordinate, 10^{-4} volt.

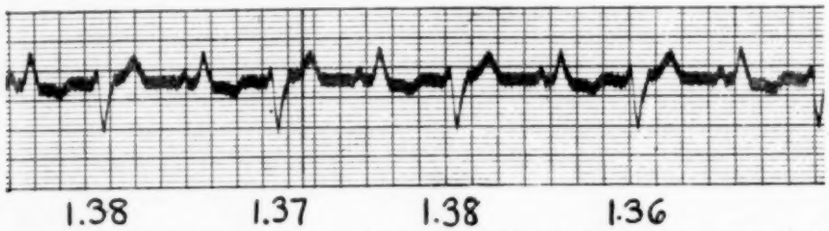

Fig. 3.—Electrocardiogram, Lead I, showing the bigeminy due to ventricular premature beats alternating with the beats of normal rhythm. Below the electrocardiogram are shown the intervals in fractions of a second between the beats of normal rhythm. Abscissa, 0.2 second, ordinate, 10^{-4} volt.

CLINICAL RECORD

History.—F. H. R., man, aged 61, married, packer in a candy factory, entered the wards of the Massachusetts General Hospital, April 8, 1915, for the relief of dyspnea and spells of weakness. Family and past history were unimportant save for the fact that his wife had had two miscarriages. One son was living and well. Patient denied venereal disease. No alcohol or tobacco was used.

The present complaint begins with the story that twelve years ago while walking home from work he fell unconscious in the street and was taken to a hospital, where he remained for three hours, rapidly recovering his senses and strength. He was told at that time by the doctors that he had "heart trouble and must take things easy." Ever since this experience the patient has noticed that he has been dyspneic on exertion. Six weeks before admission to the hospital the dyspnea increased so that he became short of breath on slight exertion. Four weeks later he was seized with an attack of syncope lasting half an hour shortly after he had carried a hod of coal up a flight of stairs. Following this attack he became more dyspneic, and suffered severe epigastric pain necessitating his staying in bed during the week following. For the four or five days just preceding admission to the hospital he had somewhat improved.

Physical Examination.—The patient was lying comfortably flat in bed without dyspnea or cyanosis. Pupils reacted sluggishly to light. Heart enlarged; apex in the sixth interspace, transverse measurement of heart by Roentgen ray, 17 cm.; width of great vessels at second space, 5.5 cm.; systolic murmur heard over precordia, reduplication of second sound at base. Pulse irregular (Fig. 1). Liver not enlarged. No edema of lungs or extremities.

Clinical Observations.—Blood pressure, from 145 to 150 mm. Hg systolic, and from 70 to 90 diastolic. Urine normal. Blood normal. Wassermann test negative. Spinal fluid normal. No fever. Respiratory rate from 19 to 28 per minute. Pulse rate from 90 to 110 per minute.

The effect of exercise, atropin (1/100 grain subcutaneously), and vagal pressure on the cardiac arrhythmia was tested, but no change in the degree of irregularity was observed. April 24, 1915, the patient left the hospital feeling somewhat improved after his sixteen days' rest in bed. No digitalis was given. July 15, 1915, an electrocardiogram showed a bigeminy very similar to that of Figure 3, but at times interrupted by numerous ectopic ventricular contractions.

SUMMARY

An instance is recorded of periods of gross cardiac arrhythmia due not to auricular fibrillation or sinus arrhythmia but to an unusual combination of ectopic ventricular contractions.

* From the Medical Service of the Massachusetts General Hospital.

TRICHINOSIS SIMULATING FRONTAL SINUSITIS

A REPORT OF THREE CASES

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During the past two years I have seen three cases of trichinosis, each referred as a probable case of frontal sinusitis. Two of these cases were seen in private practice and the third was referred to the Department of Laryngology at the Vanderbilt Clinic.

As is well known, the symptomatology of trichinosis is most variable. Most textbooks emphasize its resemblance at the onset to typhoid fever and its symptoms are usually classified under (1) intestinal or choleriform stage; (2) rheumatic or typhoid phase. It sometimes simulates appendicitis and is frequently called "rheumatism"—that facile term so often connoting only our ignorance. From a fairly comprehensive search of the literature I find no mention of cases simulating frontal sinusitis.

CASE I.—Mrs. B. R., aged 31, a physician's wife, was first seen with Dr. C. G. Coakley, Feb. 10, 1913. The patient at that time complained of a severe "cold in the head," excessive thick nasal discharge from both nares, and headache. Duration, three or four days. Examination revealed infection in both maxillary antrums. The antrums were cocainized and punctured beneath the inferior turbinates and a large amount of thick mucopurulent secretion was washed out of both antrums. The antrums were washed out daily for about ten days, when the patient was discharged cured. Patient remained apparently well until March 15, 1913, when she began to have pain in and about the left eye and left frontal region. In view of the fact that she had but recently recovered from an infection in her antrums, her husband suspected that she might have frontal sinusitis and sent her in to the office. Examination of the nares revealed only a slight amount of congestion of the mucous membrane. Transillumination of the sinuses showed that the left frontal sinus illuminated well over a moderate sized area; the right frontal illuminated poorly over a very small area; the antrums illuminated equally and well. She was referred to Dr. E. W. Caldwell for roentgenograms of the sinuses and to Dr. John E. Weeks for examination of the eyes. The roentgenograms showed an absence of a frontal sinus on the right side, a fronto-ethmoidal cell taking its place; on the left side the frontal sinus was of moderate size and of normal appearance. The antrums were also normal. Dr. Weeks reported the eye examination as negative. Nasal examination remained negative. It was now noted for the first time that the patient had an edema of both upper lids, but no edema elsewhere. Trichinosis was suspected and on questioning the patient it was learned that she had recently eaten pork and that she had had a slight amount of muscular soreness in the region of the left deltoid insertion. She was sent to the Rockefeller Institute, where the diagnosis was confirmed and the following blood count reported: white blood cells, 14,000; eosinophils, 22 per cent. The case ran a mild, uneventful course terminating in recovery.

CASE 2.—Mr. A. was referred to the nose and throat department of the Vanderbilt Clinic from the outpatient department of the Knapp Memorial Eye Hospital. He complained of pain in and about the left eye. As examination of the eyes at the hospital had been negative he was referred to the clinic as having a probable frontal sinusitis. Examination revealed an edema of both upper lids, more marked on the left than the right, but no edema elsewhere. Nasal examination was negative. His frontal sinuses illuminated equally and well as did also the antrums. A diagnosis of trichinosis was made and a differential blood count, made at once in the college laboratory, showed 20 per cent. eosinophils. This patient gave a history of having indulged freely in pork and also stated that he had had "rheumatism" in many of his long muscles. He was referred to the Presbyterian hospital but did not enter there and was consequently lost track of.

CASE 3.—Miss L. B. B., aged 32, a settlement worker, was referred to me by Dr. T. H. Russell on June 28, 1915. Patient had been ill for about a week, suffering from nausea and vomiting, pain in the right shoulder and in right chest posteriorly. Physical examination had been negative except that a small area of dulness was found in the right chest posteriorly; no change in the breath sounds, no râles or friction rubs were heard. On the day I saw her she had complained of pain in the region of the left upper lid and left frontal sinus, and as she had a slight "cold in the head" it was thought well to eliminate the possibility of an acute frontal sinusitis. Examination showed edema of both upper lids and a moderate amount of puffiness of the face, but no edema elsewhere. There was no muscular tenderness. Examination of the nose and accessory sinuses was negative. She gave a history of having eaten pork frequently. A diagnosis of trichinosis was made and a blood count ordered. The count was as follows: white blood cells, 15,000; polymorphonuclears, 77 per cent.; lymphocytes, 16 per cent.; eosinophils, 6 per cent.; transitionals, 1 per cent. The next day she developed very severe muscular pains in both lower extremities and in the left wrist and left hand, and a moderate pericarditis. Vomiting persisted and the patient was extremely ill for the next week. Two more counts were made at intervals of three days each and showed an increase of eosinophils, first to 14 per cent. and later to 22 per cent. Her symptoms gradually subsided and she made a complete recovery.

The diagnosis in all three cases rested on (1) edema of the lids (and in Case 3 of the face also) with absence of edema elsewhere; (2) negative nasal findings referable to the accessory sinuses; (3) the history; (4) the eosinophilia. It will be noted that in all these the "presenting symptom," as Cabot so well terms it, was pain in the region of the eye and frontal sinus; in only one case (Case 3) was the so-called choleriform stage present.

41 West Eighty-Third Street.

Chloroform in the Treatment of Insolation.—CASE 1.—Man, aged 37, was found in a state of unconsciousness from insolation. After two hours of futile effort to revive the patient, I concluded to try chloroform as an experiment. I gave it very lightly for five or ten minutes by inhalation, and rapid improvement in symptoms occurred. This led me to further experiment in the two cases following.

CASE 2.—A robust, well-nourished boy, aged 4, after three hours of unconsciousness, was found with a temperature of 107, pulse above 200, stertorous respiration, profound stupor and complete relaxation. The patient was stripped of clothes and laid on a bed, and chloroform was administered cautiously by inhalation. No other treatment was given the first half hour. In twenty minutes the pulse had dropped to 160, the respiration was quieted, and in half an hour the pulse was 145, the temperature 105, respiration was greatly improved, tonicity of muscles was returning, and the child manifested some return of consciousness. From this time on, the ordinary treatment was given with uneventful recovery.

CASE 3.—Man, aged 25, was overcome by heat while working in the hayfield in the afternoon. On arriving at 8 p. m., I found the patient in a profound stupor and complete relaxation, pulse 165, temperature 106.6. Except for the removal of some light clothes, chloroform cautiously given by inhalation was the only treatment in the first half hour. Results were similar and equal to those in Case 2, followed by uneventful recovery under the ordinary treatment.

GEORGE C. HANSON, M.D., Charlson, N. D.

New Instruments and Suggestions

A SIMPLE INSTRUMENT FOR THE INDIRECT TRANSFUSION OF BLOOD

BERTRAM M. BERNHEIM, M.D., BALTIMORE
Instructor in Clinical Surgery, Johns Hopkins University

Briefly, the apparatus consists of two needles, one of which is inserted into a vein of the donor, the other into a vein of the recipient, and a U-shaped tube, at the midpoint of which

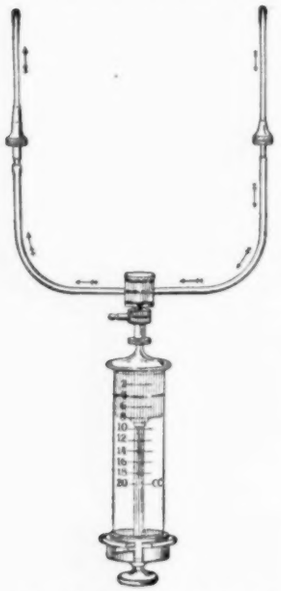


Fig. 1. — Instrument for indirect transfusion ready for use. Arrows indicate direction of blood current.

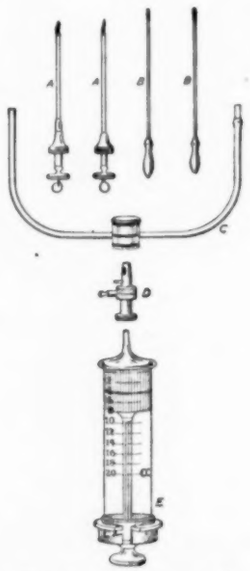


Fig. 2. — Instrument disconnected: *AA*, needles; *BB*, obturators; *C*, U tube; *D*, revolving plug; *E*, syringe.

is a pocket into which a hollow revolving plug is fitted. This plug is open at one end so as to accommodate the nozzle of a record syringe (the plug may be made to fit any other form of syringe desired), but is closed at its other end, the point of exit being in one side so as to correspond to the openings of the two arms of the U into the central pocket. The distal ends of the arms, then, fit into the needles which have been placed in the donor's and the recipient's vessels. A circuit having been completed in this manner, blood is withdrawn by means of a syringe from the donor, and the plug is gently rotated for a half circle until its lateral opening faces the opening of that arm of the U leading to the recipient's vein, whereupon the syringe is emptied. Reverse rotation brings the plug's opening into apposition with the intake tube, whereupon the syringe is again filled only to be promptly emptied into the recipient by a half rotation of the plug similar to the first movement. In other words, the syringe draws up blood from an intake tube and empties it into an outgoing tube, the rotating plug acting as an intermediary between the two tubes.

A small metal ball attached to the plug facilitates its rotation, and another metal pin prevents its rotating more than a half circle by working in a specially constructed slot. Furthermore, the plug is ground into its pocket, and, though easily removable, fits so perfectly as to prevent entrance of air into the syringes. Worthy of note, too, is the fact that when the lateral opening of the plug is "set" for one arm of the U, the other arm is effectually blocked, thus preventing any leakage.

In this manner successive syringefuls of blood may be withdrawn from the donor and emptied into the recipient with accuracy, precision and rapidity. And inasmuch as no syringe should ever be refilled more than two or three times without cleansing, it is quite simple as well as advisable to wash a few cubic centimeters of salt solution into each arm of the U as each fresh syringeful is taken up. Thus clotting is avoided. Should, however, a clot arise or should it be necessary for any reason to discontinue the transfusion temporarily, the entire apparatus may be disconnected, washed out and held ready for continuing the operation.

The bore of the needles and tubes is 2 mm., and the arms of the U are separated from each other by 12 cm., a distance quite sufficient to permit of easy manipulation when applied to apposed arms of donor and recipient. It might be added, too, that in addition to being constructed to fit special needles, this U tube is also made to fit the two-pieced tube devised by me for direct transfusion (THE JOURNAL, April 6, 1912, p. 1007). This was done because occasionally it is impossible to see the desired veins, and incision is required. In such a contingency the two-pieced tube may be easier to work with than the needles. And there is no reason why, if one is in a great hurry, the intake tube should not be placed in the radial artery instead of a vein.

2313 Eutaw Place.

A NEW MUSEUM JAR FOR THE PRESERVATION OF EYE SPECIMENS

HENRY ALBERT, M.D., IOWA CITY, IOWA

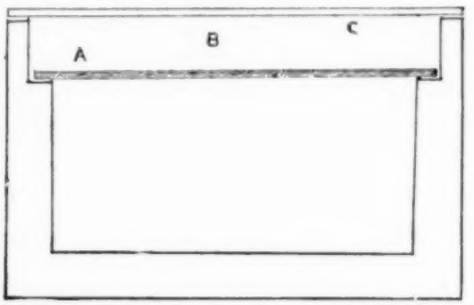
The difficulties encountered in the proper mounting of specimens of eyes in a permanent form have been so great that many persons who obtain eye specimens are deterred from mounting them because of the fact that a supposedly permanent preparation usually proves a disappointment in the course of a year or two.

There is room for much improvement in the present-day methods of mounting and labeling museum preparations of eyes.

The features desired in a museum jar are:

1. Ability to display well the structures desired.
2. Good appearance and convenience of handling specimen jar.
3. Permanency of the preparation.
4. Proper and permanent method of labeling the specimen.

Several of the museum jars for the preservation of eye specimens, now on the market, display the first two features.



Jar for the permanent preservation of eye specimens. *A*, inner cover of opaque white glass; *B*, space between two covers to be filled with cement; *C*, outer cover of transparent glass beneath which label is attached.

None of them, to the proper degree, exhibit the last two, especially when all of the desired features are considered.

With the idea of remedying such defects, I have so modified one of the commonly used jars as to insure both permanency of the specimen and proper labeling, in connection with the other desirable features which the jar already possesses (see illustration). This is accomplished by a double cover which is, as usual, placed behind the specimen. The inner of the two covers is made of white glass to furnish the proper background for the specimen. The outer cover is made of transparent glass beneath which the label is placed—thus insuring the permanency of the label. Between the two covers is a space which is filled with the proper kind of sealing material. This entirely prevents evaporation of

fluid from the jar and insures the permanency of the specimen. The distinct advantages of the jar here described, over the jars now on the market, are that it insures: (1) permanency of the preparation; (2) neatness and permanency of the label.

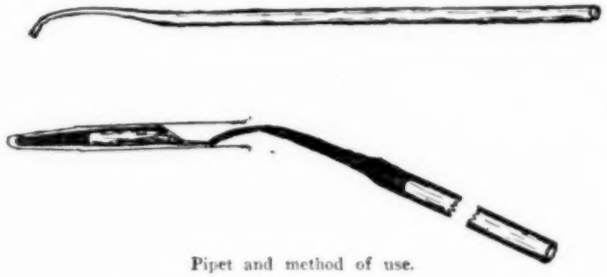
The jar here described is manufactured by F. A. Hardy & Co., Chicago.

Medical Laboratory Building.

A NEW PIPET

J. E. HUBER, M.D., PEORIA, ILL.

Some time ago I had difficulty in removing small quantities of separated serum from a small, narrow centrifuge tube. The usual method of capillary attraction with a fine-bore glass tubing pipet failed, owing to the fact that if I tipped



Pipet and method of use.

the tube sufficiently for the pipet to act, the serum movement would cause the sediment to mix, defeating the object, which was separation of the serum. In a wide tube it is not difficult to raise the capillary point of the pipet higher than the finger end, high enough to increase the flow materially.

Narrow tubes are much more of a problem. My experience with Wright's pipets for blood collection gave me an idea which I have not seen mentioned. The end of the drawn out part of the pipet, a millimeter in diameter, is carefully flamed so that it curves about 45 degrees, say about one quarter-inch from the tip, as in the accompanying illustration. With such a pipet it is possible to withdraw fluids from watch crystals held on the flat, and from tubes which are too small to permit the use of a straight pipet. It is only necessary to have a clean pipet, and touch the curved end to the liquid, keeping the finger end lower than the curved end. Capillary action will fill the narrow tube beyond the distal curve, and the siphon action does the rest. Its action is instantaneous with aqueous liquids; with serum it is a little slower, but it will drain completely any kind of a tube, straight or curved.

It is simpler than the rubber nipple pipet, and is under better control, as the release of pressure on the nipple sometimes is great enough to cause currents that whirl up the sediment and spoil the experiment.

THE PAINLESS DRESSING

S. S. GALE, M.D., ROANOKE, VA.

The dressing is yellow petrolatum with 10 per cent. boric acid incorporated in it. This boric acid ointment is prepared by the druggist and placed in a tin can. The regular petrolatum can of 1 to 5 pounds is an excellent container.

At each dressing the can containing the ointment is placed in a water bath and allowed to melt. This melting also resterilizes the ointment for each dressing. After the ointment has thoroughly melted it is poured into a large, flat, sterile pan. Pieces of gauze of various sizes and thickness, depending on the nature of the wound, are saturated with this melted ointment. After the wound has been sponged off, preferably with alcohol and normal saline, warm dressings are applied directly to the wound surface. These dressings are changed as often as is necessary, depending on the nature of the wound. When large areas are to be covered, it is usually best to have rolls of gauze about 8 inches broad and as many thicknesses as are necessary. These rolls are placed in the melted ointment and thoroughly saturated; then they are unfolded and applied directly to the wound. The greasy dressing can then be covered with plain gauze and held in place with a roller bandage.

This dressing does not dam back secretions, nor does it allow the granulations to embed themselves in the meshes of the gauze, and it can be removed absolutely without any pain. It will not dry out for several days. To my mind it is the ideal dressing in a large number of cases in which there is a large raw area to be covered.

A PHARYNGEAL TUBE COMBINING REBREATHING AND INSUFFLATION

FRANK WILCOX PINNEO, M.D., NEWARK, N. J.

In all inhalation anesthesias the most frequent and important embarrassments to respiration are obstructions in the air way. Of all causes of obstruction the tongue falling back on the glottis is altogether the most common. As this fault in technic is within the control of the anesthetist and always removable, means to facilitate holding the tongue forward are practicable without the necessity of holding the jaw forward with the hand. There has been developed in insufflation an improved method over any kind of mask for administering ether, and pharyngeal insufflation has proved that the advantages in almost all kinds of cases may be secured without the necessity of intratracheal apparatus. When the nasal catheters are not used, but introduction by mouth is preferred, the combination of a rebreathing tube, to keep the tongue forward, and a tube for insufflation of the ether is a great convenience, and for this purpose the one shown in the illustration has been devised. It is a one piece metal blade with upturned sides to fit the contour of the tongue, having a channel for introduction of an oral catheter, 5 inches long; is curved from lips to pharynx, the mouth end being a flattened tube and adjustable for different sized patients. Its advantages are: 1. It provides for automatic holding of the tongue forward without other means. 2. It has not the objections of a closed tube, being an open blade with channels easily cleaned. 3. It can be used in patients

Rebreathing tube combined with a tube for insufflation of ether.

of different sizes. 4. It has a channel for introduction of an oral catheter for pharyngeal insufflation, the catheter not being part of the pharyngeal tube. 5. The anesthetic may therefore be stopped while the blade remains in place. 6. It is efficient in holding the tongue forward without being so cumbersome as a tube like Connell's or a fenestrated frame like Lumbard's. 7. It is efficient for rebreathing, keeping the teeth and lips apart and the tongue forward. 8. It does not get clogged with mucus or blood.

199 Garside Street.

The Returns of Medical Practice.—For a livelihood, the practice of medicine brings in slow return, depending on location and opportunity. Success is laggard, as a rule, and even when emoluments balance expenditures, the profit in the practice of medicine is not considerable. The exceptional physician may grow well to do through fortunate investment, but outside of the larger cities, few get rich.—Isadore Dyer, M.D., *New Orleans Med. and Surg. Jour.*

Therapeutics

LEUKEMIA

Three papers on this generally fatal disease appear in the *California State Journal of Medicine*, September, 1915. The writers of these articles very practically present the treatment of leukemia which has shown the greatest success in prolonging a fatal termination.

Oliver (*loc. cit.*, p. 355) defines leukemia as "a malignant (idiopathic) hyperplasia affecting the leukocytic forming tissues, which results in an enormous increase in the production of white blood corpuscles." Only one type of white corpuscle is generally increased; the other types may be diminished. Occasionally more than one type of corpuscle is increased. The classification now accepted is that of Ehrlich, viz., the lymphatic and the myeloid, depending on the kind of cell that is increased in number. In lymphatic leukemia not only the lymph glands but also the spleen and other lymphoid tissue of the body may be affected, and even the bone-marrow. At any time during the course of the leukemia an acute infection may cause a rapid diminution in the numbers of leukocytes. Even slight infections in these cases of leukemia may cause death, or, if the patient recovers, the number of leukocytes rapidly again increases.

Boardman (*loc. cit.*, p. 348) has treated three cases of leukemia with benzene, and has also reviewed the literature since Korányi first suggested this treatment of leukemia, in 1912. Boardman comes to the conclusions that the benzene treatment of leukemia is the most successful yet offered; that the treatment is applicable to all forms of chronic leukemia; that when properly administered there is little danger from the treatment, but that the improvement is generally perhaps only temporary. In combination with the Roentgen-ray treatment, however, benzene treatment should be tried in all cases, except perhaps when there is nephritis.

BENZENE TREATMENT

Benzol is a trade name for benzene. It is used particularly in German literature. The benzol of commerce is impure and variable in composition. Selling[1] showed that the action of "benzol" is that of benzene. "Benzene, Medicinal," is described in New and Nonofficial Remedies, and Merck has a product on the market complying with this description.

There seems to be, as Boardman states, "abundant experimental and clinical proof that benzene acts on the leukoblastic tissues, causing a marked decrease in their functional activity in both normal and abnormal states."

During its administration benzene can cause headaches, dizziness, gastro-intestinal disturbances, and skin eruptions. It may cause too great a loss of leukocytes, hemorrhages, and nephritis, and, of course, it can cause death. The most frequent unpleasant symptoms from the therapeutic administration of benzene are gastric disturbances, which range in all degrees from simple irritation to loss of appetite, vomiting, hiccough, etc. This action on the stomach can generally be prevented by combining the benzene with olive oil and giving it in gelatine capsules during a meal. If in spite of such a method of administration the benzene tends to disturb the stomach, the capsules may be coated with phenyl salicylate, which will generally prevent their solution until they reach the intestines, where the alkalies will dissolve and break up the salicylate. More or less persistent headache and dizziness and kidney and bladder irritability should be danger signals, and heeded by withdrawal of the drug. It should also be noted that the action of benzene persists for some time after the patient ceases to take it; therefore too great care cannot be taken in watching the results of its administration. Not only must unpleasant symptoms be noted and good judgment used as to whether or not the drug should be continued, but the blood must be repeatedly counted, and when the white corpuscles are reduced to 20,000 the treatment should be immediately discontinued. The occurrence of anemia, which is occasionally produced, should also be the signal for discontinuance.

Boardman and other clinicians, notably Barker and Billings, caution against the administration of benzene while the patient is ambulatory. A patient with leukemia under the administration of benzene should certainly be at rest, and perhaps best in a hospital. The drug seems to be equally beneficial in chronic myelogenous and chronic lymphatic leukemia.

The method of its administration, as mapped out by von Korányi, and found by Boardman to be the most satisfactory, is to give it in gelatin capsules prepared just before the administration, each capsule to contain 0.50 gm. of benzene, with an equal amount of olive oil, these capsules to be swallowed during the meal. On the first day four capsules, representing 2 gm. of the benzene, should be given; on the second day 3 gm. or six capsules; on the third day 4 gm., eight capsules; on the fourth day, and to continue at this dose, 5 gm., ten capsules. This latter dose should not be exceeded, and should be reduced if the symptoms show undesired action. The drug should be stopped, as above stated, as soon as the white corpuscles have become as low as 20,000 per cubic millimeter.

ROENTGEN-RAY TREATMENT

Ruggles (*loc. cit.*, p. 355) briefly describes this treatment of leukemia. He finds that since Schultz, in 1901, and Pusey, in 1902, and Senn, in 1903, reported their first cases of leukemia treated with Roentgen ray, thousands have been so treated. The usual result of such treatment has been a more or less rapid diminution of the white count and an improvement in the general condition. There are records of patients so treated being still alive after five years, and some of them apparently well. Recurrences, however, generally take place. Ruggles finds the contraindications to Roentgen-ray treatment of leukemia to be acute forms and the coincident condition of profound anemia, and cachexia or fever. The primary effect of the treatment is that "in ten to fourteen days the lymphocytes, myelocytes, myeloblasts, and even polynuclears show swelling of the nuclei and a fragmentation of the chromatin." Later the protoplasm of the cells becomes clear or vacuolated and then the cells disappear. After a prolonged course of roentgenation the myeloid cells completely disappear from the lymph nodes and the spleen, the latter becoming "a fibroid mass containing scattered lymphoid cells."

The best results in leukemia are obtained by exposing both the long bones and the spleen to the Roentgen ray.

1. Selling: Bull. Johns Hopkins Hosp., 1910, xxi.

To sum up, the best treatment of leukemia, as far as our present knowledge goes, is the combined treatment of Roentgen ray and benzene. Benzene is a dangerous drug, and its action must be carefully watched. The Roentgen ray is a very potent force and may do harm, but the disease has always been, with unexplained intermittencies, almost invariably fatal; hence radical measures are excusable in its treatment. The old treatment of arsenic in enormous doses doubtless caused more deaths than can be attributed to benzene or to any late secondary action of the Roentgen ray.

INFANTILE SCURVY

This nutritional disturbance is becoming less frequent with the better understanding of what constitutes the proper artificial food for babes and young children.

Most proprietary foods, many cereal gruels, and overpasteurized or sterilized milks are deficient in one or more elements necessary for health and nutrition. Rarely even a mother's milk may be deficient in such elements as to allow scurvy in her nursing child.

The importance of the various amino-acids for the growth and nutrition has been shown by Osborne and Mendel, and their work has clarified many of the empiricisms while furnishing many surprises in food values. Suffice it to say that some of the amino-acids are vitally important for nutrition, and if they are absent a child will not grow normally.

In scurvy the child seems to be short of alkaline salts and the food must have been insufficiently supplied with these; or, in the case of cow's milk, too long boiling or sterilizing has so changed the normally contained alkalies as to make them unavailable for nutrition. Supplying these alkaline salts to the child generally cures the condition quickly. These salts are readily offered by the juice of fresh oranges or grapes, or by a potato soup.

This condition of infantile scurvy is referred to because, as it occurs less and less frequently, it is often overlooked or confounded with rheumatism. Infantile scurvy most frequently occurs after 6 months of age and before the age of more general feeding, that is, while the child's diet is still limited to one or two articles of food. On the other hand, rheumatic fever is very rare in children during the first eighteen months of life.

The symptoms of infantile scurvy are joint pains, muscle soreness, crying on being handled, not much fever, loss of appetite principally because the mouth and gums are sore, bleeding from the gums or slight hemorrhages into the mucous membrane of the mouth and gums. If the child has been long sick and long refusing food, he is pale; and he is anemic if there has been much bleeding. If the condition is early recognized, the child may not be ill nourished. The Roentgen ray will often show more or less swelling or infiltration of the bones, and a chest examination, according to Hess,[1] will show "an enlargement of the heart, and more especially of the right side."

Besides the oranges or potato food, the child should be given 1 drop of the tincture of ferric chlorid three or four times a day. The mother or nurse may add this drop of the tincture to each feeding of orange juice. The amount of orange juice given should be that from one or two ordinary sized oranges per day. If diarrhea is caused, grape jtice or potato soup may be substituted. Diarrhea should be prevented, as it makes the prognosis less favorable.

The joints may be kept warm with cotton, much as is done in rheumatism. A proper food for the child should be selected, and he should be rolled in a comfortable carriage into the fresh air. He should not be handled more than is absolutely necessary until he has recovered from his soreness and joint pains. The gums may be gently massaged by the mother or nurse. A little cold water frequently given the child is very acceptable in relieving the burning and irritation of the mouth. If there is bleeding, swabbing with boric acid solution and touching oozing spots with suprarenal solutions is advisable. If there are large bleeding areas in the mouth, swabbing with hydrogen peroxid solution is efficient. It may also be well to give the child an extra amount of lime as presented by the glycerophosphate of lime in 0.05 gm. powder, three times a day.

1. Hess, A. F.: Infantile Scurvy, THE JOURNAL A. M. A., Sept. 18, 1915, p. 1003.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. ITS ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

RADIO-REM, OUTFIT NO. 4.—An apparatus designed for the production of radioactive drinking water by the action of radium sulphate. It imparts about 1.8 microcurie (5,000 Mache units) to 500 Cc. water daily. (The exact efficiency is stated and guaranteed at the time of sale.)

Actions, Uses and Dosage.—See general article on radium, New and Nonofficial Remedies, 1915, p. 262.

Radium Therapy Corporation, New York (Schieffelin and Co., New York). No U. S. patents or trade-marks.

Radio-Rem Outfit No. 4 consists of two wide-mouthed glass-stoppered bottles of about 250 Cc. capacity, each containing a fired, porous clay (terra cotta) plate, stated to contain radium sulphate. While each plate is designed to impart about 0.95 microcurie (2,500 Mache units) to the water which fills the bottle in twenty-four hours, the efficiency of each tablet is stated at the time of sale and the manufacturers agree to replace the tablets and to pay for the test, if examination by the U. S. Bureau of Standards shows them to be deficient.

A test made for the Council demonstrated that during the impregnation of the water with radium emanation, no radium is dissolved in the water.

Praises for New Hanover County, N. C.—In a recent issue of the *Public Health Reports*, the United States Public Health Service calls attention to the sanitary progress that is being made in the city of Wilmington and the county of New Hanover. During 1914, 1,856 flushed closets were installed in Wilmington alone; in Cape Fear township every home has a water closet and in Masonboro township, the same condition is found. The actual field work in this county has been done by sanitary policemen and through persuasion rather than by court measures. The Wilmington City Council has voted to make available the sum of $50,000 on loan for the exclusive purpose of changing privies to flushed closets.

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SATURDAY, OCTOBER 9, 1915

THE IMPROVEMENT OF THE PUBLIC HEALTH

Anniversary and other formal public addresses before scientific audiences are likely to be reminiscent in character, reviewing the achievements of the past and sounding the praises of those who are responsible for them. An uncommon and distinctly meritorious feature in the recent address of Prof. W. T. Sedgwick, as president of the American Public Health Association, is the frank and vigorous presentation, not only of the record of American progress in public health work but also of some of its shortcomings and failures.[1] A few of the latter deserve to be brought to the attention of a larger medical audience because they involve aspects of our daily life which are of primary concern to the physician and regarding which he may properly be expected to assume an attitude of vigorous advocacy. Usually it takes considerably more courage and initiative to condemn inertia or indifference in public authorities than to commend the successes for which they are responsible.

Among the much-needed sanitary improvements which we have failed thus far to achieve in proper degree Sedgwick classes the sewage disposal systems. The public water supplies are today receiving an increasing amount of intelligent consideration from health authorities; but there is too little care devoted to the problem of human excretory waste. Public comfort stations and comparable public sanitary conveniences are among the rarities in American cities and towns. This almost universal lack, in this country, concerns one of the very elements of public health.

Sedgwick maintains that typhoid fever has not yet been reduced as far as it should have been in America. He also is frankly critical regarding the situation in respect to American infant mortality. "We have as yet," he remarks, "and in spite of ample knowledge, failed to make our American milk supplies what they should be. This is partly because we have been too timid to insist that good milk not only costs more to make but is worth more for food, and must therefore be paid for, and partly because we have not yet taught the public as we should that the only safe milk is cooked milk, and for infants, milk that is pasteurized—preferably in the final container."

Among other items which receive the charge of "conspicuous failure" are present rural and industrial hygiene and sanitation, and the problems of alcoholism and venereal disease. We are reminded that in many cities the streets—the playgrounds of the poor—are disgracefully dirty, and that we have not done all we might for the prevention of blindness, of tuberculosis or of cancer. Our vital statistics are not yet either complete or trustworthy; our health boards are too often loaded up with political refugees, political doctors, and ignorant or incompetent laymen. Our health officers are frequently untrained, ill-paid, or only part-time employees of a no-time board. It is not denied that great progress has been witnessed in many of these fields of public health endeavor. Sedgwick's attitude is rather that of a scientist impatient at the slowness with which modern contributions to knowledge have been put to use in public practices.

Sedgwick makes a further timely comment in directing attention to the neglect of what he terms preventive personal hygiene in contrast with preventive medicine and preventive sanitation. By this he means the study and care of the individual in those aspects of correct living to which we recently referred.[2] It may not be comforting to be told that even our best medical schools pay but scant attention to the manifold aspects of preventive hygiene and sanitation and that "the best teaching of today is to be found, not in the text-books or the schools, but in the leaflets issued and distributed by certain leading boards of health and life insurance companies." Criticism becomes a reproach only when it is never heeded and the better paths to which it points are never followed.

1. Sedgwick, W. T.: American Achievements and American Failures in Public Health Work, Science, Sept. 17, 1915, p. 361.

EFFICIENCY OF THE BODY AS A MACHINE

Ever since Count Rumford first suggested that the muscular work of two horses produced enough heat to boil water, speculation has been rife as to how much heat man loses during work and how efficient the human body is as a machine. The relationship between the energy consumption and the output of work has been extensively studied with various methods and machines. Dumas and Boussingalt,[3] by determining that a man used 300 gm. of carbon in climbing Mont Blanc, computed the efficiency of the body as 33 per cent. Frick[4] found that under the best conditions isolated muscle has an efficiency of 25 per cent. Gau-

2. The Love of Health, editorial, The Journal A. M. A., Sept. 25, 1915, p. 1116.

3. Dumas and Boussingalt: Essai de statique des êtres organisés, 1884; cited by Amar: Le rendement de la machine humaine, Paris, 1910, p. 21.

4. Frick: Arch. f. d. ges. Physiol. (Pflüger's), 1878, xvi, 58.

tier estimated that a working diet is 1,780 calories in excess of a resting diet, and that a man produces 270,000 kilogrammeters of work per day, which is equal to 588 calories. But of the 270,000 kilogrammeters, 100,000 are lost in the different movements of the body and "in the friction of the machine," so that the useful work is 150,000 kilogrammeters, or 352 calories. Therefore, of the 1,780 calories but 352 are transformed into work, giving a net efficiency of 20 per cent. Smith[5] found that, of the total heat incidental to muscular work, only one fifth was used in the production of mechanical work.

There are notable inaccuracies, however, in each of these methods; hence the careful studies and the improved methods used by Benedict and Cathcart[6] in determining the efficiency of the body are especially valuable. These investigators used a bicycle with an accurately calibrated electric brake. The amount of oxygen consumed and the carbon dioxid produced by a man riding this bicycle ergometer was determined with a new form of respiration apparatus. Benedict and Cathcart thus determined the amount of heat that was eliminated per minute and the nature of the materials that were burned in producing this heat. All tests were performed twelve hours after the last meal, so that the food materials used were those stored in the body. By computing the relationship between the heat equivalent of the external muscular work as measured by the ergometer and the total heat output, they found that the net efficiency varied from 9 to 24 per cent., depending on the various speeds and loads that were placed on the bicycle rider. These differences are easily explained on comparison with a steam engine. A certain amount of steam is used in keeping up heat when the engine is not working at all. Slow revolutions and also too rapid revolutions of the fly wheel are less efficient in the production of work. In short, there seems to be a certain rate of speed for each engine at which it is most efficient. So it is with man in work production. Benedict and Cathcart found the average net efficiency of a professional cyclist and of four untrained men to be about 21 per cent. for each person. They found that the output of heat was constant per ten revolutions of the bicycle pedals, but that the increase in effective muscular work was not constant; there was a falling off as the higher rates are reached. The optimum efficiency was at 70 revolutions per minute. One objection to the accuracy of these results is that the cutaneous respiration is not considered, but this is a minor factor and would influence the final result but little.

Chauveau first found that during muscular work there is an excessive combustion of carbohydrates, so that in the subsequent period the catabolism is that of a body deficient in glycogen. Benedict and Cathcart have confirmed this and have demonstrated that the more severe the muscular activity, the heavier the draft on the carbohydrate material in the body. On the cessation of work the so-called "specific working catabolism" disappears, and for a time a much lower portion of carbohydrates is burned for the total energy output than during a usual resting period. Chauveau has also contended that when the supply of glycogen is depleted, fat may be converted into glycogen. According to Chauveau, 30 per cent. more energy per unit of work is liberated than when carbohydrate is burned, since heat which cannot be otherwise utilized is set free during the conversion of fat to glycogen. The transformation of fat into glycogen, however, lacks conclusive proof, and Benedict and Cathcart have not observed the additional heat loss even in work experiments so severe that fatigue resulted.

This question of body efficiency is closely linked with athletic training, a subject about which we are still poorly informed. From this work it would seem that training influences metabolism but little and that diets are not so prominent a factor as we have assumed.

5. Smith: Phil. Tr., 1859, cxlix, 681.
6. Benedict and Cathcart: Muscular Work, Publication 187, Carnegie Institution of Washington.

RADIUM AS A FERTILIZER

Discoveries, so long as they are novel, naturally excite expectant optimism as to their application. This is the stage at which honest but undiscriminating enthusiasm and deliberate fakery both flourish. Radium, the possibilities and limitations of which are still undefined, is an instance in point. Time and experience are needed to reduce to rational limits the many claims made for it.

One of the uses suggested for radium is the stimulation of plant growth. Various experimenters have investigated the effect of radium emanation on the growth of plants under laboratory conditions. Gager, Fabre and Stocklasa have each reported stimulation of the growth of plants or the germinating activity of seeds under the influence of an optimum strength of radium, while a greater strength retarded growth.

The results of these laboratory experiments aroused interest in the possibility of using radium as a soil fertilizer under practical agricultural conditions. H. H. Rusby, professor of materia medica in the College of Pharmacy of Columbia University, has made experiments in this direction. He arranged with the Standard Chemical Company of Pittsburgh to use as a fertilizer the powdered residue carnotite ore left after the extraction of all the radium possible. This residue, or ore tailings, is said to contain about 2 or 3 mg. of radium to the ton. It was applied, mixed with fertilizer, on various contiguous plots in proportions of about 25, 50, 100 and 200 pounds to the acre, respectively. Control plots were treated in the same way except that they did not receive the radioactive mixture.

Rusby's report[1] is published in the house organ of the Standard Chemical Company. It describes in glowing terms quite remarkable results, which, if they could be accepted, would mark a new era in agriculture. Nearly all field crops showed an increased yield. Many garden vegetables in treated plots attained a larger size than those in untreated plots. Mere proximity to treated plots seemed to affect favorably the size of vegetables in untreated plots. Rusby also believes that the quality and palatability of vegetables and the size and brilliancy of flowers were improved by the influence of the radium ore mixture.

These results are not confirmed by field tests recently made at the University of Illinois. C. G. Hopkins, professor of agronomy, and W. H. Sachs,[2] chief in agronomy and chemistry at the Agricultural Experiment Station, report field tests of radium fertilizer made at the University of Illinois during 1913 and 1914.

In these tests the radium was used at three rates of application, 0.01 mg., 0.1 mg. and 1 mg. of radium per acre, costing, respectively, $1, $10 and $100 per acre. On one series of plots the radium was applied in the form of radium barium chlorid solution diluted with distilled water. The check plots received the same quantity of distilled water without radium. Another series of plots received solid radium barium sulphates, thoroughly mixed and pulverized with dry soil from the field. The control plot received the same weight of soil without the radium. Hopkins and Sachs explain that the amount of radioactive substance applied in these tests was made small in order to avoid any appreciable effect from the substance other than that due to radioactivity. Some effects might conceivably be obtained from the application of 100 or 200 pounds of mineral salts per acre. In the heaviest applications the amount was less than 5 pounds of total salts per acre.

Corn was grown on the land in 1913 and soy beans in 1914. The work of the two years comprised 144 tests with corn and 240 tests with soy beans.[3] In all these tests the average variation from the controls was so slight and so evenly distributed, for and against, as to compel the conclusion that radium, at any of the rates applied, had produced no effect on the crop yields either the first or the second season.

It will be observed that, whereas the University of Illinois investigators avoided applying any large bulk of salts, Rusby applied his radium in the form of refuse carnotite ore. Of this he used from 25 to 200 pounds per acre, as against the small amount (less than 5 pounds per acre) employed at the University of Illinois. That is, of course, Rusby applied practically from 25 to 200 pounds of the constituents of carnotite (a hydrated vanadate of uranium and potassium) along with the radium. The amount of radium with which he treated the soil per acre, taking his own highest estimate of 3 mg. to the ton of ore tailings, must have been approximately from 0.3 mg. to 0.04 mg. as against the 1 mg., and 0.1 mg. and 0.01 mg. used at the University of Illinois.

A *reductio ad absurdum* of the radium fertilizer theory is given by R. R. Ramsey,[4] associate professor of physics in Indiana University. It is well known that radium is universally distributed, being present in most substances, however, only in minute traces. Taking Rutherford's average value for the amount of radium in the crust of the earth, Ramsey figures that the amount of radium element in the upper 5 inches of an acre of soil is 1 mg. Thus the maximum amount of radium used by Hopkins and Sachs (1 mg.) merely doubled the amount of radium element in the upper soil; the maximum amount used by Rusby increased the amount of radium element by only about one third. The amount of radium emanation which issues from an acre of soil, however, is not confined to the emanation from the radium element in its superficial 5-inch layer; it is from 50 to 100 times as much. Hopkins and Sachs increased the amount of radium emanation in the soil by only about 1 or 2 per cent.; Rusby increased it by only a fractional percentage.

As remarked earlier, experiments indicate that it is possible to increase vegetable growth, under laboratory conditions, by the application of radium. It may be that eventually some means will be found by which radium can be utilized in practical agriculture. At present, however, the best evidence we have does not encourage us to regard this as an immediate possibility.

1. Rusby, H. H.: The Influence of Radioactive Earth on Plant Growth and Crop Production, Radium, January and February, 1915, pp. 68 and 94.

2. Hopkins, Cyril G., and Sachs, Ward H.: Radium Fertilizer in Field Tests, Science, May 14, 1915, p. 732.

3. Detailed data are given in Bull. 177, Univ. Ill. Agric. Exper. Station.

GAS DIFFUSION IN THE LUNGS

With increasing altitudes the pressure of the air is reduced, and the oxygen tension becomes lower and lower. At a height of about 15,000 feet the barometric pressure is little over half an atmosphere, and the oxygen tension therefore only about 11 per cent. of an atmosphere. The presence of man at any considerable altitude necessitates an adjustment on his part so that the persistent undiminished oxygen requirement of the organism can be satisfied under the enforced changes of atmospheric conditions. Otherwise serious symptoms, which go under the designation of oxygen starvation, may arise. They doubtless play some part in the malady familiarly known as mountain sickness.

One of the adaptations to the barometric conditions prevailing at considerable heights is an increased pulmonary ventilation. There is an augmentation in

4. Ramsey, R. R.: Radium Fertilizer, Science, Aug. 13, 1915, p. 219.

both depth and frequency of respiration. The increase in pulmonary ventilation diminishes the alveolar carbon dioxid tension, increases the oxygen tension, and improves diffusion. Another important means of rapid adaptation is associated with changes in the circulation. A deficient passage of oxygen from the lungs to the blood may, so far as heart and tissues are concerned, be accommodated for by increasing the rapidity of the blood flow. This is effected by a quickened pulse rate. Such responses are due solely to the low tension of the oxygen, as the recent experiments in the pneumatic cabinet at the Finsen Institute in Copenhagen have demonstrated.[1] Again, there may be an increased quantity of hemoglobin or of red corpuscles. If this response occurs, the necessary amount of oxygen can be transported with a slower rate of circulation, and the arterial oxygen tension can be raised.

Some years ago, Haldane and his collaborators arrived at the conclusion that, even when these facilitating adjustments and adaptations are taken into account, as soon as any considerable altitude is reached the necessary supply of oxygen cannot be furnished through the lungs to the blood satisfactorily by the mere process of physical diffusion of the gas. The expedition of the Duc d'Abruzzi in the Himalayas, in which a height of 24,600 feet, corresponding to a barometric pressure of 312 mm., was attained, has been recited as a striking example of the insufficiency of the simple diffusion theory. The problem concerns the forces by which oxygen is transported from the alveolar air into the blood. If the tension of oxygen in the blood is under certain circumstances higher than that of the alveolar air, there can be no doubt that forces other than diffusion must come into play. Haldane and his collaborators have maintained that this is, in fact, the case. The Anglo-American expedition of Douglas, Haldane, Henderson and Schneider to Pike's Peak in 1912[2] furnished further carefully selected observations which have been interpreted in favor of the newer hypothesis that the acclimatization at considerable altitudes is accomplished by an increased arterial oxygen tension due to active secretion of oxygen through the alveolar epithelium.[3]

Dr. Marie Krogh[4] of the University of Copenhagen has taken exception to this widely quoted hypothesis that simple diffusion of gases through the lungs of man is insufficient to explain intakes of oxygen measured under the most adverse conditions, and especially during muscular work at low oxygen pressures. On the contrary, it is maintained, as the result of the newest investigations, that diffusion alone will account for the gas exchange between the alveolar air and blood in all cases which have been examined in sufficient detail, both at low oxygen tension and during the heaviest muscular work. According to Dr. Krogh, during work at low oxygen pressures, it will as a rule be diffusion through the lungs which sets the limit for the intake of oxygen; during work at normal atmospheric pressures, the heart will probably in most cases be the limiting factor.

There are other newer results respecting the combustion processes in the lungs which harmonize well with these conceptions.[5] The discovery of the adequacy of simple physical processes to account for physiologic functions is always a source of satisfaction. The critical studies of Dr. Krogh make it seem unnecessary to assume any cellular activity on the part of the alveolar wall, either in the form of a direct secretion of oxygen, or in the nature of a combustion of intermediate metabolites supposed to increase the mean oxygen tension difference.

1. To What Are Due the Effects of Altitude on Man? editorial, THE JOURNAL A. M. A., Sept. 25, 1915, p. 1112.
2. Anglo-American Expedition to Pike's Peak, editorial, THE JOURNAL A. M. A., Aug. 10, 1912, p. 449.
3. Douglas, Haldane, Henderson and Schneider: Phil. Tr. Roy. Soc., London, B, 1913, p. 203.
4. Krogh, Marie: The Diffusion of Gases Through the Lungs of Man, Jour. Physiol., 1915, xlix, 271.
5. Evans, C. L., and Starling, E. H.: Jour. Physiol., 1913, xlvi, 413. Henriques, V.: Biochem. Ztschr., 1913, lvi, 230.

THE CAUSE OF RAT-BITE FEVER

It sometimes happens that a carefully formulated description of an unfamiliar group of symptoms serves to arouse sufficient consideration to bring to light other similar or closely related instances. Cases grow in number, and as medical attention is focused on them, a condition which was infrequently recognized or diagnosed may lose its rarity and enter into the group of less exceptional diseases.

With these thoughts in mind we refer to Crohn's recent contribution to the subject of rat-bite fever,[6] known in some of the foreign tongues as Rattenbiss-Krankheit or sokodu. This disease, best known in Japan, where it is recognized by the medical profession, occurs among the classes liable to be bitten by rats. The symptoms are incident to a bite and are followed after a variable incubation period by a single paroxysm or by regularly recurring paroxysms of chills, fever and sweats, lasting a few days, and associated with the occurrence of a local or diffuse bluish-red exanthem. The disease is often characterized by marked nervous symptoms. The course of the malady is signalized by progressive emaciation and weakness; the duration is variable, often very prolonged. Fatal cases are not infrequent.

From a study of about fifty cases reported in the world's literature, some of it dating back several decades, along with personal experience at the Mount Sinai Hospital, New York, Crohn has speculated on the nature of rat-bite fever as a disease. He notes that in the nature of its course it resembles most clearly relapsing fever, the febris recurrens of the Asiatics

6. Crohn, P. B.: Rat-Bite Fever, Arch. Int. Med., June, 1915, p. 1014.

and Europeans. The diseases resemble each other in the intermittency of the symptoms; the incubation period in both is variable. In its favorable reaction to salvarsan the disease has a common factor with both syphilis and relapsing fever, but more particularly with the former. The finding of a spirochete as the cause of both the latter diseases suggests this as the etiologic factor in this malady. In the prominence of the nervous symptoms and the postfebrile paralyses, rat-bite fever recalls relapsing fever. The one reported postmortem examination in this disease revealed a serous meningitis, with increase of cerebrospinal fluid. The irregular paraplegias and atrophies recall the tabetic lesions of syphilis.

Many authors have indicated a belief in one of the species of protozoa as the etiologic factor, but with the exception of the statements of Ogata, whose work has unfortunately not been confirmed, such parasites have not been observed. Many of the symptoms of the malady might, in Crohn's opinion, be the result of a powerful toxin elaborated at the site of the wound and transmitted along the regional nerve paths to the central nervous system, in a manner similar to the propagation of the toxin of tetanus. The point in favor of a spirochete as the causative agent is the similarity of the disease to relapsing fever and syphilis, as regards both the marked nerve symptoms and the apparent curability by salvarsan. In favor of a protozoan cause is the alternation of the paroxysms with afebrile periods, recalling the effects of the malarial plasmodia, though this occurs also in spirochetal diseases.

Now that attention has been turned more prominently to the possibilities involved, new cases will undoubtedly be brought to light in greater number. We shall then perhaps be in a position to ascertain conclusively whether or not the disease is actually caused by living parasites, a conclusion to which much of the evidence presented strongly points.

Current Comment

THE COMPLEMENT-FIXATION REACTION IN TUBERCULOSIS

The presence in the serum of tuberculosis patients of a substance which is capable of binding complement in the presence of suitable antigen has been repeatedly demonstrated. Why this reaction has not come into more general use as an aid in the diagnosis and prognosis of tuberculosis is not apparent. Recent French literature contains observations on the diagnostic importance of this reaction. Besredka and Manoukhine[1] report the results of complement-fixation experiments in guinea-pigs, rabbits and human beings, using as antigen a tuberculin prepared from egg-broth cultures of tubercle bacilli. The test was positive in guinea-pigs after the fourth day of infection, and remained so with fluctuations until shortly before death, when it became negative. In man these observers found the reaction uniformly positive in the early stages of tuberculosis and in a majority of cases in the second stage. They observed partial or negative results in the third stage and regarded a negative reaction in advanced tuberculosis as a sign of approaching death. Debains and Jupille[2] report observations on a series of 600 individuals, including patients in all stages of tuberculosis, patients having various other diseases but no signs of tuberculosis, and apparently normal persons. Some of the latter gave feebly positive reactions. Also patients with a strongly positive Wassermann gave a positive reaction with tuberculous antigen, owing, it is suggested, to lipoids derived from the egg constituents of the medium which react with syphilitic serum in a manner similar to tissue-extract antigen. In advanced cases of pulmonary tuberculosis with cavitation and cachexia feeble or negative reactions were often obtained. In cases of tuberculous pleurisy with effusion negative reactions were frequent. These are explained on the supposition that in advanced tuberculous infections the antibodies in the serum have already been bound or neutralized by substances produced by the large numbers of bacilli present. Experiments with rabbits indicate that the complement-fixing activity runs parallel with the resistance of the animals to infection. If the same conditions obtain in human cases, the test would give valuable information to the clinician regarding the course of the disease. It would seem, from the evidence accumulated by workers in this field, that the complement-fixing reaction can be used with advantage in the diagnosis and prognosis of tuberculosis. The procedure certainly merits trial in hospitals and institutions dealing with tuberculous patients.

1. Besredka and Manoukhine: Ann. de l'Inst. Pasteur, 1914 xxviii, 569; Compt. rend. Soc. de biol., 1914, lxxvi, 197.

2. Debains and Jupille: Compt. rend. Soc. de biol., 1914, lxxvi, 199.

HEREDITY IN TWIN BIRTHS

In no field of study is the possession of accurate statistics more necessary than in problems of heredity. An interesting problem concerns the question of the likeness of animals and their offspring with respect to birth as singles, twins, or triplets. Heape,[3] in an analysis of the English statistics available, says that there is reason to believe that twin lambs produce more twins than single lambs, and that the influence of heredity is brought to bear. Rietz and Roberts[4] have taken up the question as determined by the statistics available in this country. In the classes of sheep studied in this instance—registered Shropshire sheep—they found that in general the twin parents give a larger percentage of twins among offsprings than do parents born as singles. They call attention to the fact that as it requires large numbers to establish the significance of the difference found, and it would not be surprising if within a flock of fair size—one hundred—one may in

3. Heape: Jour. Roy. Agr. Soc., England, 1899, x, 236.

4. Rietz, H. L., and Roberts, E.: Degree of Resemblance of Parents and Offspring with Respect to Birth as Twins for Registered Shropshire Sheep, Jour. Agric. Research, 1915, iv, 479.

some cases get even a larger percentage of twins from single parents than from twin parents; but such fluctuations would not occur in the large majority of cases. What the significance of these results are for the human being can be determined only by a similar study of heredity in twin births.

EDIBLE SNAILS

To most Americans the idea of using snails in the diet will not awaken gastronomic enthusiasm; but there are people in various parts of the world to whom the suggestion of the use of other mollusks, such as oysters and clams, would be repugnant. It is not necessary to go back to the days of the elder Pliny for evidence that edible snails have had a place on the menus of many countries. It is stated that during our own oyster season, from September to April, more than 200 million snails are disposed of in Paris alone. The daily consumption of "escargots" in the French capital has been estimated at 50 tons when trade is at its best. In the belief that the American people can be educated to see the true worth of the edible snail, which might be grown with profit in the United States, a government expert has collected some facts bearing on their use.[1] The European war has added a further interest to the possibility of snail culture. Comparatively few Americans have ever tasted snails, know of their preparation as food, or even consider them a fit article of diet. Among the foreigners in our population, snails have a limited sale. Those sold in the fish markets of our larger cities have practically all been imported from France. Abroad, snails are by no means regarded in any sense as a national dish. They are included in the dietary much as is the oyster in this country, as a table luxury or delicacy. In respect to composition, the two groups of mollusks furnish about the same yield of nutrients. In Europe, snails are raised commercially under an intensive system of culture in many places in snaileries. Rust[1] believes that although snail culture may not be very profitable in Europe, where economic conditions are different, in that the food for the animals must be grown and supplied to them regularly and everything done with much labor on restricted areas of land, in the United States snail farming might, with judicious publicity, and in time, become profitable. Whether or not it is advantageous, from the standpoint of nutrition, to attempt to introduce a new food to the American table is a question of individual preference. Almost every one, Rust writes, who has ever eaten well-prepared snails, admits their gastronomic worth, from the points both of nutritive value and of flavor, and there are many states where they could be grown and kept fresh until used, and where they would prove a very welcome addition to the somewhat limited menu of the locality. In the Mississippi Valley, for instance, where conditions for their cultivation are almost ideal, they could be grown at practically no cost (either in money, time or labor), and might be used to a great extent in place of oysters, which they greatly resemble in flavor when properly prepared. Such a practice would be advantageous, for the snail is possibly preferable as an article of human consumption. It is cleaner, feeding daintily, as it does, only on the cleanest of vegetable tissues, while oysters, not being able to move about in search of food, must take what comes to them in the water, are sometimes fattened in water impregnated with bacteria-laden sewage, and thus, occasionally, act as carriers of typhoid and other diseases. At any rate, we can be prepared to receive the suggestion of the addition of snails to the American menu without the revulsion of feeling which it awakens in many at present.

1. Rust, E. W.: Edible Snails, Yearbook U. S. Dept. Agric. for 1914, p. 491.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Fresno Gets State Society Meeting.—The Council has decided that the 1916 meeting of the Medical Society of the State of California is to be held in Fresno in April.

Personal.—Fire in Caruthers, September 10, destroyed the office of Dr. George A. Meracle.——Dr. Lyle G. McNeile has been appointed deputy health commissioner of Los Angeles.

State Board Changes.—On September 2 Governor Johnson appointed Dr. Wilbur A. Sawyer, Berkeley, a member of the State Board of Health to succeed Dr. Donald H. Currie, Sacramento, the secretary of the board, resigned, and Dr. Robert A. Peers, Colfax, to succeed Dr. James H. Parkinson, Sacramento, term expired.——At a meeting of the Board, September 4, Dr. Sawyer was elected secretary.

State University Happenings.—Dr. James Craig Neel, San Francisco, has been appointed instructor in obstetrics and gynecology (on an academic basis); Dr. William Boericke has been appointed clinical professor of homeopathic materia medica, and Dr. Sanford B. Hooker and Carl L. A. Schmidt have been appointed research assistants in pathology in the University of California to undertake researches as to typhoid fever and in problems of biologic specificity, provided for by the Edith J. Claypole Memorial Research fund in pathology and George Williams Hooper Foundation for Medical Research.

Ordinance Regarding Diphtheria Carriers.—Among the cities in California which have ordinances providing for the isolation of diphtheria carriers are San Francisco and Berkeley, in both of which places opposition has arisen to the enforcement of the ordinance. In San Francisco an attempt was made in the Board of Supervisors to repeal the ordinance, and in Berkeley Assemblyman George Gelder has threatened to appeal to the courts to prevent the enforcement of the isolation ordinance. A number of his children had been affected by the law, being excluded from the schools on account of the discovery by the school inspectors that they were diphtheria carriers. Assemblyman Gelder, it is said, has been opposed to a number of health regulations, among them the laws in regard to vaccination against smallpox. Dr. George E. Ebright, San Francisco, president of the State Board of Health, takes the stand that the repeal of the isolation ordinances would be a deadly menace to the health of the community. He says that the carriers in San Francisco quarantined at the Isolation Hospital are comfortable and are treated with the greatest care. The State Board has found little difficulty in controlling diphtheria in other parts of the state, but little opposition having arisen on account of attempts at regulation.

ILLINOIS

Personal.—Dr. Frank A. Stubblefield, medical director of the Alton State Hospital, who has been ill in St. Joseph's Hospital, Alton, is reported to be improving.

Foot and Mouth Disease.—Two herds of Guernseys and Holsteins, 204 in number, belonging to Arthur Meeker, found to be infected with foot and mouth disease, have been slaughtered.——Of the Guernsey herd of Mrs. Durand, two have died from secondary infection and a stricter quarantine has been put into effect at Crab Tree Farm.——The animal health commissioner of Iowa has notified the assistant state veterinarian that there must be no exchange of stock of any kind between Illinois and Iowa, owing to the outbreak of foot and mouth disease in Illinois.

Chicago

Diphtheria Carriers.—Almost 500 diphtheria carriers have been discovered among the schoolchildren of Chicago since the opening of school on September 7, according to the records of the department of health.

New Armory Dedicated.—Field Hospital Companies Nos. 1 and 2, Ill. N. G., dedicated their new armory in Chicago, October 1. Major William J. Swift, M. C., Ill. N. G., commanding Field Hospital No. 1, presided as toastmaster.

Personal.—Dr. John A. W. Fernow was painfully injured in a collision between street cars, October 3, but rendered first aid to the others who were injured.——Dr. Anthony Balcerzak has been elected chief medical examiner of the Polish National Alliance.

KANSAS

Personal.—Dr. Joseph M. McKamey, Kingman, sustained a skull fracture in a collision between his motor car and a train, September 12.

Baby Week at Topeka.—During baby week, held at Topeka, October 5-8, under the auspices of the State Board of Health Division of Child Welfare, Dr. Lydia Allen DeVilbiss, director, and Dr. Harold B. Wood, 159 babies were registered for examinations. Picture films were lent by the National Association of Tuberculosis, Cincinnati Department of Health, Kansas State Board of Health and the University of Kansas. There was an exhibit of A. M. A. placards (cartoons), other placards, and sketches and water color designs by Dr. Wood. There were also displays of baby clothing and furniture and a pure milk exhibit. Programs were given afternoons and evenings.

KENTUCKY

Personal.—Dr. James Bruce has been reappointed house physician and chief of interns, at the Louisville City Hospital, succeeding Dr. Thomas L. Harris, resigned.——Dr. John H. Taylor, Providence, was operated on September 13, in St. Mary's Hospital, Rochester, Minn. The gallbladder and appendix were removed.

Hospital Notes.—A contract for a new tuberculosis hospital at Henderson was awarded September 15.——A hospital is to be built at once in connection with the Stuart Robinson College, Mission School, Blackey, near Whitesburg. About $10,000 is to be expended for hospital and equipment.——Dr. Thomas O. Helm, Bowling Green, has disposed of his lease and interest in St. Joseph's Hospital to Drs. Morton M. and Robert C. Moss.

New State Officers.—The sixty-fifth annual meeting of the Kentucky State Medical Association was held in Louisville, September 21 to 24, under the presidency of Dr. John J. Moren, Louisville, who at the first session yielded the chair to the president-elect, Dr. James W. Kincaid, Catlettsburg. Hopkinsville was selected as the next place of meeting and the following officers were elected: president-elect, Dr. Ap Morgan Vance, Louisville; vice-presidents, Drs. Myrvin E. Hoge, Quicksand; Amos M. Davis, Denton, and James B. Mason, London; secretary, Dr. Arthur T. McCormack, Bowling Green (reelected); delegates to the American Medical Association, Drs. Carl Lewis Wheeler, Lexington; and W. W. Richmond, Prestonsburg; councilor for the Fifth District, Dr. Charles W. Hibbitt, Louisville; nomination for members of the State Board of Health, Drs. Charles Z. Aud, Cecilia; Daniel M. Griffith, Owensboro; and Robert C. McChord, Lebanon. Dr. Edwin A. Stevens, Mayfield, was selected as orator in medicine; and Dr. William L. Gambill, Jenkins, as orator in surgery.

MASSACHUSETTS

Changes in Harvard Faculty.—The Harvard corporation has made the following appointments for the year opening September 27: Dr. John L. Morse, formerly associate professor of pediatrics, has been made full professor.——Dr. Frederick T. Lewis, formerly assistant professor of embryology, has been appointed associate professor.——Dr. John Warren, assistant professor of anatomy, has been made associate professor.——Dr. John L. Bremer, assistant professor of histology, has been made associate professor.——Dr. Francis W. Peabody has been appointed assistant professor of medicine and Dr. Herbert S. Langfeld, assistant professor of psychology.

Personal.—Dr. Fred P. Moore, Foxboro, has been appointed health supervisor of schools of Des Moines, Iowa.——Dr. Clarence H. Leland, Lowell, was severely cut and bruised by the overturning of his automobile in Lexington, September 13.——Drs. Roger I. S. Lee and Charles A. Porter, Boston, members of the Harvard Medical unit, returned from abroad, arriving in New York September 12.——Dr. William H. Devine, Boston, has been appointed director of school physicians by the Boston School Board.——Dr. Henry Colt, Pittsfield, has been appointed medical examiner for Berkshire County.——Dr. Milton J. Rosenau has resigned as a member of the Public Health Council of Boston and has been succeeded by John T. Wheelright.——Dr. Thomas F. Harrington, Boston, deputy commissioner of labor and industry, has been seriously ill at his summer home in Lynn with ptomain poisoning complicated with appendicitis and phlebitis.——Dr. Moses G. Parker, Lowell, was reelected president of the Parker Historical and Gynecological Society at the fifth annual reunion held in Lexington.——Dr. Lemuel F. Noble, Boston, has returned after several months' war service in Europe.——Dr. Francis D. Donoghue, Boston, arrived in New York from Europe, September 2.

MARYLAND

Meeting of Faculty.—The semi-annual meeting of the Medical and Chirurgical Faculty of Maryland will be held in Westminster, October 28.

University of Maryland Medical School Reopens.—The formal opening exercises of this institution were held October 6. Dr. Arthur M. Shipley, acting dean, presided, and the speakers were Dr. Randolph Winslow, of the University of Maryland, Dr. Harry Friedenwald, of the College of Physicians and Surgeons, and Dr. Ridgely B. Warfield, of the old Baltimore Medical College.

Protest Against Dr. Jones' Removal.—The Baltimore City Medical Society held a special meeting on October 1, adopting resolutions indorsing warmly the services rendered by Dr. C. Hampson Jones, as assistant health commissioner and protesting against his removal. The meeting was marked by intense feeling. The society has appealed to Dr. John D. Blake, the new commissioner of health, to use his prerogative by reappointing Dr. Jones.

Mosquito War Near End.—The first move to end the mosquito work has been completed and fifty inspectors have been laid off. The force will probably be broken up October 15. Sanitary Engineer W. D. Wrightson of the U. S. Public Health Service and his four inspectors will remain on duty until that date. Maj.-Gen. Wm. C. Gorgas, Surgeon-General of the U. S. Army and Surgeon-General Rupert Blue, of the U. S. Public Health Service, will make a final inspection of the work before that date.

Personal.—Dr. William H. Welch of Baltimore, a member of the Rockefeller Medical Mission, who is on his way to China, has reached Tokyo, Japan, where he with the other members of the mission were entertained by the Japanese premier.——Dr. John D. Blake, Baltimore, has been appointed commissioner of health by the mayor, to succeed Dr. Nathan R. Gorter. Dr. Gorter has been appointed a member of the State Board of Health by Governor Goldsborough.——Dr. Robert H. Crawford, Baltimore, has returned after several months' duty with the Red Cross unit in Silesia.

MISSOURI

Cancer in Missouri.—The department of preventive medicine of the University of Missouri, as a part of the campaign against cancer in that state, has published in the University *Bulletin* a special article on the early diagnosis of cancer, by a member of the faculty of the university. The purpose of the bulletin is to call the attention of the laity to the general subject of cancer and especially to the importance of regarding the earliest symptoms. The bulletin especially warns the people against quacks and bogus testimonials regarding the cure of cancer.

St. Louis

Hospital Unit Not Needed.—The St. Louis University hospital unit, recently organized for service abroad, has been notified by the director-general of the royal army medical staff that for the present he is unable to use any more American hospital units.

Memorial Resolutions.—At a joint meeting held by the board of trustees and staff of the St. Louis Eye, Ear, Nose and Throat Infirmary, September 22, resolutions were adopted setting forth the high and honorable standing of Dr. Horatio N. Spencer and expressing deep sorrow at his death.

Personal.—Dr. Malvern B. Clopton sailed from New York September 25 for work with the American ambulance in Paris.——Dr. Guthrie McConnell has been placed in charge of the pathologic and bacteriologic laboratory of the Waterloo (Iowa) Medical Society.——Dr. Frederick Hagler has returned after six months' work in military hospitals in Serbia.——Dr. Milton Schaie has resigned as medical director of the Jewish Home for Chronic Invalids and Consumptives of St. Louis.——Dr. Ralph L. Thompson has returned from service in the British War Hospital in France.

NEVADA

To Muzzle Dogs.—The State Board of Health and the Hygienic Laboratory, September 18, issued a bulletin calling attention to the necessity for muzzling all dogs, on account of the prevalence of rabies, chiefly among coyotes. The disease existed in many parts of the state, it is said.

State Sanitary Survey.—Surgeon Carroll Fox, U. S. P. H. S., has completed a sanitary survey of the state in company with Dr. Simeon L. Lee of the State Board of Health. He believes that the State Board of Health should be completely reorganized; that the State Hygienic Laboratory, and Pure Food and Drug Commission should be placed under the control of the State Board of Health instead of the State University, and that a state sanitary engineer should be appointed. Dr. Fox, in his report, called attention to the fact that Nevada is the most poorly equipped state in the Union in the matter of its health service; that the State Board of Health was allowed an appropriation of only $6,500 while the Fish and Game Commission was allowed $8,000, and furthermore, that the latter commission expended last year $10,000 above this appropriation and the succeeding legislature passed a bill approving the extra expenditure. In the belief of Dr. Fox, at least $14,500 should be appropriated for the State Board of Health.

NEW YORK

Personal.—Dr. Smith Baker, for more than forty years a practitioner of Whitestown and Utica, announced his retirement from practice, September 25.——Dr. Alexander C. Calisch, Oswego, has been appointed a member of the Board of Civil Service Commissioners.

Psychopathic Ward Needed.—Drs. Walter S. Goodale and B. Ross Nairn, Buffalo, appeared before the aldermanic finance committee, September 23, to endeavor to secure an appropriation of $2,000 for the establishment of a psychopathic ward for suspected insane and alcoholic cases at the Buffalo Municipal Hospital.

New York City

Crile Speaks Before Academy.—At the stated meeting of the New York Academy of Medicine, October 7, Dr. George W. Crile, Cleveland, delivered the Wesley M. Carpenter lecture on "Kinetic Drive—Its Phenomena and Its Control."

Personal.—Dr. Louis T. Klinker has suffered a mental breakdown and has been taken to Bellevue Hospital for observation.——Dr. Abraham L. Wolbarst began a series of public genito-urinary clinics at the West Side German Dispensary and Hospital, at 8:30 p. m. October 7. He also began a similar series of clinics on October 5, at 3 p. m. at Beth Israel Hospital and Dispensary.——Dr. Mary M. Crawford, Brooklyn, who has been serving for about a year in the American Hospital just outside of Paris, has returned to this country.——Dr. J. W. Brown, Dr. and Mrs. H. Holbrook Curtis and Dr. John E. Jones have sailed for Europe.

Columbia University Opens.—President Nicholas Murray Butler opened Columbia University's one hundred and sixty-second year on September 29 and in his address gave the assurance that within five years the project launched by the University and the Presbyterian Hospital for a great medical center will have been begun. He said that the $7,000,000 which the University must raise as its share would be forthcoming and added that plans had been adopted looking to the accomplishment of the task. Dr. Francis Carter Wood, director of the Crocker Cancer Research Fund, delivered the opening address to the students of the medical school, taking as his subject "Magic and Medicine." The point which he particularly emphasized was that the exploitation of radium cures of cancer by the lay press had been and was influencing many cancer patients to defer a resort to surgery, whereas in truth radium would cure but a small percentage of cancers and would do nothing which could not be done by surgery.

NORTH CAROLINA

Antityphoid Inoculation.—The State Board of Health reports that 47,037 patients were immunized against typhoid fever during the two first campaigns conducted by the State Board of Health.

Hospital Notes.—The Western North Carolina Methodist Conference, at its last meeting, advocated the establishment of a hospital in Salisbury.——The Tranquil Park Company has been organized at Charlotte to establish a hospital and sanatorium for the treatment of noncontagious medical diseases. Dr. John Q. Myers, Charlotte, is president and physician in charge of the institution; and Dr. John P. Munroe is vice president.——The Bloomsbury Sanatorium is under course of construction and will be ready to receive patients by the first of January. It is located on a site of 15 acres of rising ground near Bloomsbury.

OHIO

Lumber Magnate Donates Site for Hospital.—Peter Kuntz, Middletown, has purchased forty acres of land west of Dayton, which he has donated to the Sisters of the Poor of St. Francis, for a hospital. About $500,000 will be expended for the institution.

License Restored.—At its meeting July 6, the Ohio State Medical Board voted to restore the license of Dr. J. C. Ludwig of Cincinnati, which was revoked in 1907, for reasons involving moral turpitude. Many prominent citizens of Cincinnati endorsed his application for restoration. He is 77 years of age.

Not to Use Title of "Doctor" or "M.D."—The Ohio Board has adopted a regulation that limited license certificates will not confer the right to use the title "Doctor," "Dr.," "M.D.," "Physician" or "Surgeon." The regulation provides, however, that licensed practitioners in the limited branches on their cards, office signs, letter heads or elsewhere, may use the name of the limited branch specified in their certificates and may properly sign themselves as indicated.

Registration of Limited Practitioners.—In accordance with the Platt-Ellis law which gives the State Medical Board of Ohio the duty of registering practitioners of the various medical cults, blanks have been sent out to all such practitioners in order to secure a complete record. The cults mentioned in the law are chiropractic, naprapathy, spondylotherapy, neuropathy, mechanotherapy, electrotherapy, hydrotherapy, suggestive-therapy, psychotherapy, magnetic healing, massage, Swedish movement, chiropody and optometry.

Infantile Paralysis.—September 25, it was reported from Cleveland, that sixty-five homes had been quarantined by the City Health Department on account of infantile paralysis in the section of the city known as Willoughby. The death rate had been 6 per cent., which was 2 or 3 per cent. higher than the normal mortality rate. Health Commissioner Ford issued instructions as to personal prophylaxis. At Canton, September 23, the Board of Health ordered the quarantine of eight homes in which cases of infantile paralysis had occurred since September 1. In the previous week no new cases of the disease had developed. The order to quarantine these homes came from the State Board of Health.

Personal.—Dr. Oscar Theodore Schultz, formerly assistant professor of pathology in Western Reserve University, Cleveland, has been appointed professor of pathology and bacteriology in the College of Medicine of the University of Nebraska, Lincoln and Omaha.——Dr. David Marine, Cleveland, has returned from Compiegne, France.——Dr. Harry H. Snively, Columbus, in charge of the American Red Cross Hospital at Kiev, Russia, is said to have been made a general officer by the Russian government.——Dr. John F. Beachler, Columbus, fell down stairs, September 10, and sustained severe injuries.——Rev. Michael V. Halter, formerly a physician of Akron, has been appointed temporary pastor of Holy Trinity Church, Avon.——Dr. Howard W. Arndt, Lore City,

was seriously injured in a collision between his automobile and a street car at Lore City and is under treatment in a Cambridge hospital.——Dr. Sylvester R. Best, Centerburg, has been appointed chief statistician for the Department of Vital Statistics.

PENNSYLVANIA

Hospital Cornerstone Laid.—The cornerstone of the Philadelphia Memorial Hospital, the gift of 11,200 Philadelphia Free Masons, was laid, September 29, with impressive ceremonies, on a part of the large tract dedicated to the care of dependent Masons, at Elizabethtown, Pa.

Changes in Pittsburgh University Faculty.—Dr. John Jenkins Buchanan, for fourteen years professor of surgery in the University, has resigned as an active teacher and has been elected professor emeritus.——Dr. Robert Talbott Miller, for the past five years a member of the surgical faculty of the School of Medicine, and lately appointed associate professor of surgery, has been appointed full professor in charge of that department.

Infantile Paralysis.—The outbreak of infantile paralysis at Erie and in that vicinity has about subsided and Drs. Fox and Rivas, sent by the State Board of Health to take charge of the situation, left Erie September 24. It was believed that very few additional cases would occur if the people took the proper hygienic precautions about which they were carefully instructed by the two experts. No new cases had been reported since September 15. Altogether there have been fifty-nine cases in the city and fifteen in the county outside, since January, 1915.

Philadelphia

Reception of Medical Club.—The Medical Club of Philadelphia will give a reception, October 15, in honor of Surgeon General Rupert Blue, United States Public Health Service, and Rear Admiral William C. Braisted, Surgeon General, United States Navy.

New Scholarships at Women's School.—Through friends of the Women's Medical College, two new scholarships are this year available for women students. The scholarships carry with them the sums of $225 and $250 a year, respectively. The faculty of the college will choose recipients from the list of applicants.

New Law on Communicable Diseases.—The Department of Public Health and Charities has issued a pamphlet edition of "An Act to safeguard human life and health throughout the commonwealth, by providing for the reporting, quarantining, and control of certain communicable diseases, and for the prevention of infection therefrom, and prescribing penalties for violations of the act," approved May 28, 1915.

Personal.—Dr. John A. Kolmer has been appointed assistant professor of experimental pathology in the University of Pennsylvania.——Dr. L. D. Englerth has been appointed chief resident physician to the Frankford Hospital.——Dr. E. E. Montgomery was operated on for hernia in Jefferson Hospital, recently.——Dr. William C. Hollopeter, for fifteen years professor of pediatrics at the Medico-Chirurgical College has resigned and has been succeeded by Dr. James H. McKee. ——Dr. William B. Swartley is on his way to join the staff of the American Ambulance Hospital in France, where he will remain about three months.——Dr. Charles K. Mills, having resigned his chair in the Medical School of the University of Pennsylvania, will devote attention to postgraduate teaching, research work and private practice.

RHODE ISLAND

State Society Holds Fall Meeting.—The Rhode Island Medical Society held its fall meeting at St. Joseph's Hospital, Providence, September 2, after dinner and sports at Hillsgrove.

Infantile Paralysis.—The occurrence of fourteen cases of infantile paralysis at West Warwick resulted in an investigation by members of the State Board of Health. It was found that there was no association of the cases, except that in two instances there were two patients in the same family. The disease could not be traced to any definite focus. None of the patients was over 7 years old.

Personal.—Dr. Olin S. Pettingill, assistant superintendent of the Rhode Island State Sanatorium, has been offered the position of superintendent of the Western Maine Sanatorium, Hebron.——Dr. Elisha A. Cohoon of the staff of the Rhode Island State Hospital has been appointed administrative officer of the psychopathic department of the Boston State Hospital and pathologist for the Massachusetts Board of Insanity.

TEXAS

For the Eradication of Infections.—A meeting of the State Board of Health and representatives of the federal government, representatives of the state agricultural and mechanical college and the live stock sanitary commission of Texas was called October 5 for the purpose of formulating a plan for the eradication of Texas fever, charbon, hog cholera, etc.

Personal.—Drs. Claude O. Harper, Thomas M. Jeter, Samuel A. Lundy, and Lyman A. Barber have accepted appointments as members of the board of health of Fort Worth.——Dr. Jake T. Wilhite has retired from the staff of the State Hospital, Austin, to accept the position of physician-in-charge of the Pasteur Institute.——Dr. Raleigh L. Davis has been appointed second assistant physician of the State Hospital, Austin; Dr. T. N. Miller, third assistant; and Dr. Wooten D. Lightfoot, fourth assistant physician.——Dr. Frank E. Piner, formerly city health officer of Denton, returned from war service in England, September 24.

The Situation at Galveston.—Mr. Charles Saville, director of sanitation of the city of Dallas, has made a report on the sanitary conditions at Galveston following the recent storm. He recommends that the water for drinking and cooking purposes be boiled; that systematic bacteriologic analyses of the city water be taken daily; that all water mains and dead-ends be flushed out; that the use of water from private wells and underground systems be interdicted, and that a sterilizing apparatus be installed at the water pumping station for the water supply of the city. He also recommends the construction of dry closets; the systematic flushing and cleaning of sewers and catch basins; the keeping of garbage and refuse in fly-tight receptacles; the incineration of all garbage and refuse; the removal of sand from the city streets and the establishment of a high temperature refuse incinerator for permanent use.

WISCONSIN

Free Silver Nitrate.—The State Board of Health has notified the local boards of health that a 1 per cent. solution of silver nitrate will be furnished free of charge to all physicians and midwives in the state.

Personal.—Dr. Argo M. Foster, Racine, who was injured in a collision between his automobile and an electric car in August, has been obliged to undergo an operation on the skull and is under treatment in a Chicago hospital and is said to be doing well.

Legislation Helps Sanatoriums.—Five new county tuberculosis sanatoriums will be erected in Wisconsin this fall, in Marathon, Grant, Jefferson, Dunn and Fond du Lac counties. In four of these counties the county board members are already at work on the proposition and in the fifth county, the county medical society and private citizens have taken the initiative.

Madison Does Not Want Polluted Drinking Water.—Medical men of Madison, at a meeting September 9, passed resolutions based on the proposition to exchange the artesian water supply for Madison for surface water from Lake Mandota; and setting forth that the present supply is pure, that its cost is moderate and that there is an abundant supply. Furthermore, that Lake Mandota is polluted by the sewerage of the State Hospital for the Insane and the residences around the lake. They, as physicians of Madison and the vicinity, and members of the Dane County Medical Society, believe that the change proposed is perilous, and call on the city council to retain the present source of water supply, to establish a modern and adequate plant in charge of a competent sanitary engineer.

CANADA

Personal.—Dr. William Henderson, Sarnia, Ont., who has a commission with the Royal Army Medical Corps in England, has been appointed physician-in-chief of a hospital ship for the Dardanelles. The ship carries six physicians, twelve nurses and has 450 beds.——Prof. Thomas G. Brodie, F.R.G.S., and Prof. John J. MacKenzie, B.A., M.D., will shortly return from England to resume their duties at the University of Toronto. Both professors went over as supernumeraries with the University of Toronto Base Hospital. ——Dr. Fortunat Lachance, Winnipeg, mayor of St. Boniface, Man., will shortly leave for the front in charge of one of the departments of the military hospital being equipped by Laval University, Montreal. Dr. Lachance will have the rank of lieutenant-colonel.——Col. John T. Fotheringham, Toronto,

chief medical officer of the Second Canadian Overseas Force, writing to Dr. Goldwin W. Howland, Toronto, says that Lord Kitchener and the inspector-general of the War Office have stated that the second force now in France both in training and physical fitness was the finest body of men that had left England for France, a place of honor up to this time held by a division from Ulster.——Dr. Robert G. Brett, Banff, is to be appointed the next lieutenant-governor of the province of Alberta.

Ontario Medical Commission Appointed.—The Ontario government has at last appointed its long-promised commission on the subject of medical education and practice in that province. The commissioner is the Hon. Mr. Justice Hodgins of the supreme court of Ontario. Wide powers are given to the commissioner as seen in the instructions issued with the appointment. To inquire into and report on all or any matters relating to education for the practice of medicine in or affecting the province of Ontario; the construction, powers, duties and regulations of any body corporate or incorporated and of any faculty or department thereof having any relation to medicine, the exercise of the same and the revenues and expenditures thereof; the situation, legal or otherwise, of such bodies in regard to each other or to the province; the establishment, creation, control and regulation of any new body intended to have relation to medicine; the existing or possible methods of examining, licensing or otherwise authorizing the carrying on by individuals of the practice of any methods having any relation to medicine and the standards prescribed and followed or proper to be established and followed; the present positions, status and practice of osteopaths, dentists, nurses, opticians, optometrists, chiropractors, Christian Scientists or others practicing or professing medicine; the existing laws of Ontario in relation of any of the foregoing and their practical operation; any matter arising out of the foregoing which it is necessary to investigate with a view of the above inquiries.

Hospital News.—In his public address in Toronto on September 27 the prime minister of Canada, Sir Robert Borden, referred to the work of the Canadian hospitals abroad. Canada has established in Great Britain, France and at the Dardanelles no less than sixteen hospitals. These are for all the forces of the British empire and not for Canadians alone. Eight of them are located in Great Britain; five are in France; three are at the Dardanelles. On the staffs of those hospitals are 2,400 Canadians, and 525 trained nurses. Sir Robert stated that he had visited nearly fifty hospitals while abroad and he considered that none were better equipped, better organized, or in which the wounded received better care and attention than the hospitals which have been organized by the people of Canada.——At Hamilton, Ont., the cornerstone of a new hospital was laid on September 24 by the lieutenant governor of the province, Sir John Hendrie. The new institution will be known as Mt. Hamilton Hospital. It will be the center of a group which it is intended to establish there. The hospital is maintained in its entirety by the civic administration. Dr. Charles O'Reilly, Toronto, formerly superintendent of the Toronto General Hospital, was present and delivered an address. Dr. O'Reilly went from the Hamilton General Hospital many years ago to the Toronto General as superintendent.——The Massey-Harris employees, Toronto, are to establish in England a convalescent home for wounded Canadian soldiers. The yearly maintenance will be about $50,000, and the original cost of equipment about $25,000. Canadian doctors and nurses will be employed.

GENERAL

Ohio Valley Physicians' Meeting.—The seventeenth annual meeting of the Ohio Valley Medical Association will be held in Evansville, Ind., November 3 and 4, under the presidency of Dr. E. Otis Smith, Cincinnati.

Colored Physicians Hold Meeting.—The annual meeting of the National Medical Association was held in Chicago, September 1 to 3. Dr. Ulysses G. Dailey, Chicago, was elected president; Dr. Walter G. Alexander, Orange, N. J., secretary; and J. R. Levy, Winston-Salem, N. C., treasurer. The association will hold its next meeting in Kansas City, Kan.

Roentgenologists Elect Officers.—At the annual meeting of the American Roentgen Ray Society held in Atlantic City, September 23 to 25, Dr. Augustus W. Crane, Kalamazoo, Mich., was elected president; Dr. William A. Evans, Detroit, treasurer, and Dr. F. W. Manges, Philadelphia, was reelected secretary. Cincinnati was selected as the place of meeting for next year.

Clinical Congress of Surgeons.—The sixth annual session of the Clinical Congress of Surgeons of North America will be held in Boston during the week of October 25. The mornings and afternoons will be devoted to clinics and four evening meetings will be held. On October 25, the president-elect, Dr. Charles H. Mayo, Rochester, Minn., will deliver the annual address.

Missouri Valley Physicians Elect New Officers.—At the annual meeting of the Missouri Valley Medical Association held in Des Moines, September 21 to 23, under the presidency of Dr. Granville Ryan, Des Moines, the following officers were elected: president, Dr. John P. Lord, Omaha; vice presidents, Drs. Charles G. Geiger, St. Joseph, Mo.; and Hobart A. Weston, Des Moines, Iowa; secretary, Dr. Charles Wood Fassett, Kansas City, Mo. (reelected); and treasurer, Dr. Oliver C. Gebhardt, St. Joseph, Mo.

Rockefeller Foundation Expenses for 1914.—The financial transactions of the Rockefeller Foundation show that the administration expenses for the year 1914 were $13,731.60; appropriations for the International Health Commission, $133,237.06, of which $36,651.96 went to the China Medical Commission and $10,000 was appropriated for research work on governmental problems; for war relief there was expended $994,613.06 and for purchase of the Bird Refuge in Louisiana, $224,886.95. The total expenses for the year were $1,421,031.81.

Electro-Therapeutists Hold Meeting.—At the annual meeting of the American Electro-Therapeutic Association held in Atlantic City, September 14 to 16, under the presidency of Dr. John W. Torbett, Marlin, Tex., the following officers were elected: president, Dr. Jefferson D. Gibson, Denver; vice presidents, Drs. J. Willard Travell, New York; Frank B. Granger, Boston; William L. Clark, Philadelphia; Sidney A. Twinch, Newark, N. J.; and William Martin, Atlantic City; secretary, Dr. Byron Sprague Price, New York; treasurer, Dr. Emil Heuel, New York (reelected), and registrar, Dr. Frederick M. Law, New York (reelected).

Conference on Social Hygiene.—The First Central States Social Hygiene Association will be held at the Congress Hotel, Chicago, October 25 and 26, under the auspices of the Central States Division of the American Social Hygiene Association. The first session of the conference will be held in the evening of October 25, and will be given over to discussions of general features of the social hygiene movement. In the forenoon of the following day, the moral and educational features of the social hygiene movement will be taken up; in the afternoon, the medical and public health aspects will be treated; the evening session will be given over to discussions of the legal and administrative phases.

Meeting of National Safety Council.—The fourth annual safety congress of the National Safety Council will be held at the Bellevue-Stratford, Philadelphia, October 19 to 21. At the general session on October 19 the subjects considered will include: The development of the safety idea; safety as an indispensable part of an efficient manufacturing organization; the safety idea as related to the credit of a business organization; vital importance of the visiting nurse in industrial work; and the standardization of safeguards. The other meetings of the council will be sectional meetings, to be composed of groups of persons interested in accident prevention problems as they affect special industries and will consist of experience meetings and discussions of various points involved. The final meeting on October 21 will be a general meeting of all sections to discuss the question "How to Educate the Workman."

New England Tuberculosis Conference.—The second New England Tuberculosis Conference will be held under the auspices of the National Association for the Study and Prevention of Tuberculosis, October 22 and 23, under the presidency of Dr. Stephen J. Maher, New Haven, Conn. The first session will be held at the Hotel Kimball, Springfield, Mass., and will take up methods of antituberculosis work. At a second session held on the ninth floor of the Forbes and Wallace department store on Kinshon Street, sales methods of the Red Cross seal will be described. The third session will be held in the First Congregational Church at which the topic for discussion will be "Industry and Tuberculosis." The fourth and fifth sessions will be held at the Westfield Sanatorium and at these sessions programs of antituberculosis work and the diagnosis of incipient cases of pulmonary tuberculosis will be considered.

Candidates for Army Medical Corps.—The following candidates, who have passed the preliminary examination for appointment in the Medical Corps of the Army, have been invited to attend the 1915-1916 session of the Army Medical

School, Washington, D. C.: Arden Freer, Bellevue Hospital, New York City; John S. Caul, Laceyville, Pa.; Charles C. Hutter, 245 West North Avenue, Chicago, Ill.; Harvard C. Moore, 623-624 Medical Building, Portland, Ore.; William F. Rice, Government Hospital for the Insane, Washington, D. C.; Charles G. Sinclair, Providence Hospital, Washington, D. C.; Edward A. Noyes, 818 Lombard Street, Portland, Ore.; Joseph L. Furden, 1633 Monroe Street, Washington, D. C.: Herbert H. Bauckus, Town Line, Erie County, N. Y.; Robert P. Williams, 1616 North Second Street, Harrisburg, Pa.; Frederick H. Petters, 100 High Street, Buffalo, N. Y.; Edwin B. Maynard, first lieutenant, M. R. C., Fort Benjamin Harrison, Ind.; Walter E. Koppenbrink, 5324 Bartmer Avenue, St. Louis, Mo.; Frank W. Wilson, U. S. Soldier's Home, Washington, D. C.; Clarence S. Ketcham, Union Protestant Infirmary, Baltimore, Md.; Luther M. Ferguson, 91 Arlington Street, Newton, Mass.

Examination for Medical Corps of the Navy.—The next examination will be held Nov. 15, 1915, at Washington, D. C.; Boston, Mass.; New York, N. Y.; Philadelphia, Pa.; Norfolk, Va.; Charleston, S. C.; Great Lakes (Chicago, Ill.); Mare Island, Cal., and Puget Sound, Wash. Applicants must be citizens of the United States, and must submit satisfactory evidence of preliminary education and medical education. The first stage of the examination is for appointment as assistant surgeon in the Medical Reserve Corps and embraces the following subjects: (a) anatomy, (b) physiology, (c) materia medica, (d) general medicine, (e) general surgery, and (f) obstetrics. The successful candidate then attends a course of instruction at the Naval Medical School, during which course he receives a salary of $2,000 per annum, with allowances for quarters, heat and light, and at the end of the course, if he successfully passes an examination in the subjects taught at the school, he is commissioned an assistant surgeon in the Navy. Full information with regard to the physical and professional examination may be obtained by addressing the Surgeon General of the Navy, Navy Department, Washington, D. C.

Pediatric Clinical Meeting.—A meeting of pediatricians of the central and western states will be held at Chicago, October 15 and 16. On the evening of October 15 a permanent organization will be effected at a meeting to be held in the Auditorium Hotel. Clinics will be held at the various pediatric centers throughout both days.

Bequests and Donations.—The following bequests and donations have recently been announced:

Brooklyn Eye and Ear Hospital, $5,000; Brooklyn Hospital, Home for Consumptives and Home for Aged Men and Aged Couples, each $2,500 by the will of Robert B. Woodward.

The German, St. Luke's, Roosevelt and Presbyterian hospitals, New York City, each an equal share in the estate of $231,158 by the will of Henry Miller.

Mexican Relief Fund, $25,000, a donation from the Rockefeller Foundation.

Hospital of the University of Pennsylvania, several beds endowed in memory of her husband, Dr. George M. Stiles, Cohocton, by the will of his widow, Mrs. Amanda Stiles.

Medico-Chirurgical College of Philadelphia, conditional bequests amounting to $150,000.

Henderson (Ky.) City Hospital, a donation of $15,000 by a citizen providing the city donate a similar amount.

Washington, D. C., Home for Incurables, $2,000 to establish the George Riggs Memorial Room; Episcopal Eye, Ear and Throat Hospital, $2,000, and Georgetown University, $4,000 for the maintenance of the Elisha Francis Riggs Memorial Hospital, by the will of Medora Riggs.

American First Aid Conference.—The American First Aid Conference referred to in these columns two weeks ago is calling on state societies for their cooperation in the form of a small committee to cooperate with the proposed organization. The following questions are also being sent to the chief surgeons of railroads, mines and manufacturers and others:

1. What has been your experience with the most available first aid package and dressing for small and large wounds?

2. What has been your experience with the immediate employment of antiseptics in accidental wounds; what antiseptic have you used, in what strength, and how applied? Have you employed tincture of iodin; if so, how and what have been the results?

3. What in your experience has been the most efficient and most readily applied method of fixation for injuries of the (a) upper and (b) lower extremity?

4. Have you considered the construction of a stretcher, which, in addition to serving as a means of transportation of injured, will have appliances for the fixation of the upper and lower extremity, somewhat along the lines of a Bradford splint, or the Gibon naval splint?

5. Please state your views on some liquid ointment dressing which would be available for first aid in large wounds and burns with the object of preventing the usual dry-gauze dressing adhering to the wound and rendering subsequent dressings painless.

The committee asks that each question be answered on a separate sheet—each sheet signed. Those who have suggestions to make as regards this important subject should write to the secretary, Dr. Joseph C. Bloodgood, 904 North Charles Street, Baltimore.

A Real Medical Reserve Corps for the Navy.—Steps have been taken by the Navy Department to make the Medical Reserve Corps a reserve in fact for the Medical Corps of the Navy. Under the terms of a circular just issued by the department, medical reserve officers are required to bind themselves to perform active duty in the Navy whenever they are called upon by the secretary. Officers of the Medical Reserve Corps are also required to report to the Navy Department at least once in every six months as to their location and their physical fitness for military duty. Their number is limited to 300, and they are to be honorably discharged at the age of 55 years. In outlining the duties of the Medical Reserve Corps the circular says:

When the president of the United States signs and confers a commission in the Naval Medical Reserve Corps he does so with the full realization that he is placing special trust and confidence in the ability and patriotism of the individual to whom the commission is issued, and, whether in peace or in war, this medical officer enjoys the prestige and standing that results from such recognition. Officers of this corps receive no financial return except when on active duty, and during time of peace, the number so assigned will necessarily be limited. But it is believed that love of country and pride in the possession of such a commission will influence the best among the medical profession to accept this honor and responsibility, whereby they may keep in close touch with the Navy Department, and thus be prepared to serve their country in a national emergency. Every officer of the Medical Reserve Corps will, on appointment, be required to bind himself to be subject to the laws and regulations governing said corps and to perform active duty in the Navy when called upon, at any time during a period of at least five years from date of appointment, during which period such officer will not be honorably discharged from the Medical Reserve Corps except for physical disability in the event that his services should no longer be required; this regulation, however, not to prevent any officer who desires to do so from submitting his resignation at any time. After five years from date of appointment, the resignation of any officer of the Medical Reserve Corps will, in the absence of special circumstances, be accepted when submitted. However, the acceptance of an officer's resignation is in all cases discretionary with the president.

FOREIGN

Deaths in the Profession Abroad.—Among those who have been killed while tending the wounded in the field is G. Heimann of Berlin, one of the pioneers in eugenics, and Prof. H. Piper of the Institute for Physiology, at Berlin. Piper's work on the physiology of the senses is well known, especially the results of application of the filament galvanometer in study of this subject.

Training Women Laboratory Helpers in Germany.—The Woman's College at Leipzig offers a special four semester course of training in all the branches needed in laboratory work. This Hochschule für Frauen is said to be especially well equipped for the purpose, as also for fitting trained nurses for superintendents' positions. The laboratory course includes, besides the usual branches, microphotography and Roentgen-ray work.

Imposters Seek to Benefit by Dearth of Physicians.—The *Deutsche medizinische Wochenschrift* states that one of the annoying by-effects of the prevailing lack of duly qualified medical men at many points is that impostors have sought to pose as regular physicians. Forged credentials and diplomas have been presented to the authorities at Leverkusen and elsewhere and the *Wochenschrift* warns of the necessity for being wary for a time in making appointments to medical positions or summoning a new physician.

List of Latin-American Physicians.—A series of manuscript consular reports on druggists, pharmacists, physicians, surgeons and dentists, which has been collected by the Bureau of Foreign and Domestic Commerce, Washington, D. C., includes the following Latin-American countries: Honduras, British Honduras, Cuba, Chile, Costa Rica, Dutch Guiana, British Guiana, Colombia, Nicaragua, Mexico, Dominican Republic, West Indies, Venezuela, Paraguay, Panama, Haiti, Salvador, Guatemala, Ecuador, Argentina, Brazil, Peru and Uruguay.

The New Public Health Department at Berlin.—About a year ago the authorities organized for the city of Berlin what is officially designated as the "Deputation für das städtische Gesundheitswesen" and the "Medizinalamt." The full-time medical officer appointed at the head of the system

left for the front soon after the opening of the war, and there has been much dissatisfaction over his persisting absence from his post. He has finally returned and taken up his duties, and the municipal authorities have at last formally outlined the work for the new health department. It is to have under its care everything connected with the health of the populace, especially the supervision and promotion of the welfare of all municipal institutions and arrangements dealing with health and those supported by municipal funds. This includes welfare work for infants, for children of all ages before, during and after the school age, measures to repress alcoholism, tuberculosis and sexual diseases; further all measures to promote general hygiene (air, light, water, sewage disposal, food, housing, prophylaxis of epidemics, the disinfection system, food inspection, and finally, supervision of the municipal lodging house, workhouse, orphan asylums, hospitals, schools, bathing establishments, etc. The new Medizinalamt is practically the old municipal inspection system, and it is subordinate to the above department. The latter is expected to study and test all the questions arising in its sphere and to present its final decision to the municipal authorities, the magister or the single departments involved. The other departments and authorities are also expected to confer with this department before taking any important step that might affect the public health in any way.

WAR NOTES

Hospital for Wounded Aviators.—A convalescent home has been provided for wounded aviators in a chateau at Viry-Chatillon, Dr. Moujin, owner of the chateau, is medical director of the home.

Sanitary Commission to Leave Serbia.—Dr. Richard P. Strong, head of the American Sanitary Commission in Serbia, has sailed from Naples on his way home. He says that the majority of the American physicians who have been engaged in Red Cross work in Serbia, will leave that country by October 10.

German-American Hospital Unit Starts for the Front.—A delegation of physicians and nurses sent by the American Physicians' Expedition Committee sailed for Europe, from New York, September 9. The medical staff of the unit consists of Drs. Herman Fischer, Louis Brooks, Joseph J. Ling, J. L. Mathesheimer, together with four nurses.——Dr. William L. Bulach, New York, sailed on the same steamer to offer his services for work for the Red Cross abroad.

Heliotherapy for the Wounded.—An institution has been fitted up at Dürrheim in the Black Forest in Germany for systematic sunlight treatment of wounded soldiers and those with tuberculous lesions in the bones. The institution was organized by Bernhard of St. Moritz, who was the first to apply heliotherapy to war wounds, but his assistant, W. Staehelin, is now in charge. Dürrheim is over 2,000 feet above sea level. Torpid wounds, fistulas and delayed healing from any cause are regarded as indicating heliotherapy, as are also injuries from gangrene, frost bite and action of caustics, and large persistently secreting wounds.

Great Britain Needs More Surgeons.—Sir James Barr, vice president of the British Medical Association, in an appeal for surgeons for armies going abroad, says that 2,500 will be required, and that there will be no course open but to apply to the United States to fill the necessary complement of medical men if Great Britain cannot produce the requisite doctors.——The *Lancet*, in its issue of August 28, states that the medical schools will be very short of students on account of the large number of young men, of the educated class, who have joined the army. The future will see an increased demand for medical men, and consequently a greater prospect of success.

Red Cross Items.—Hon. Ira Nelson Morris, American minister to Sweden, has completed arrangements with the Russian and Swedish governments to facilitate the journey to Petrograd of nine physicians, thirty-nine nurses and a large quantity of supplies sent by the American Red Cross.——The physicians and nurses of the American Red Cross mission to Germany, who came to Berlin after the close of the hospital at Gleiwitz and Kosel, were given medals by the German government, September 22.——The members of the American Red Cross units of Vienna and Budapest have been given similar decorations by the Austro-Hungarian government.——The American Red Cross unit, which has been stationed at Kiev, Russia, was moved to Makarov, September 15.

BEHIND THE BEYOND WITH THE BRITISH ARMY

[The following is from a Canadian medical student who is with a British army medical corps.]

The attitude of the surgeons and nurses toward the wounded in the war is commendable in the highest. I have not witnessed in civil hospitals so much tenderness and compassion toward patients as has been exhibited in dealing with these boys from the front. If a patient is a bit restless at the approach of anesthesia, the administrator will gently and quietly allay the nervousness by ways and means not often used at home. In the admission and examination tent where the chaps come in fresh from the trenches, disheveled, dirty and weak, their vitality and nervous energy at a low ebb, the senior surgeons will gain their confidence and good will on the spot by quiet, tactful and sympathetic questioning, terminating in the inevitable "We'll fix you up all right, old man." In the whole wide world of suffering there is no class of helpless more deserving and more in need of tender ministrations than this broken humanity—the first fruits of war. In this phase of the war, America will have a share of the glory. Recently a British Tommy told me he was in the Chicago Hospital (a British general hospital operated by doctors and nurses from Chicago) "where they are absolute bricks. After being up there on the line for months, you forget that there is that sort of kindness floating around." A Harvard unit nearby is very popular with English soldiers too.

There is an interesting tale about that part of the organization which lands the wounded in the reception tent, a process which involves gathering the wounded in "no man's land," in the trenches and back of them, nearly all accomplished at night by the glare of the sickly bluish-white flares of the enemy, often only by the rays of the moon—and sometimes no light of any kind looks down on the horrors of those bloody wastes of France when the gloomy task is accomplished by the sense of touch. The system includes, too, the field dressing station and the field ambulance train. The field dressing station may not be a station at all, but is far more likely to be an upturned stump, a rock, a bit of ruin, anything that will afford a slight protection. The base for supplies and billet is the cellar of a ruined building, a deserted barn or sometimes a plain dugout. Moreover, this is the farthest outpost of succor for the wounded, and is the most mobile department of the army medical corps, save the stretcher bearers, for it is right up behind the line and, from the nature of its service, advances and retreats with it.

The field ambulance corps is the mobile unit which connects the "gathering" system on the front with the "end of steel" located not so very many miles behind the line.

At the "rail head" is a casualty clearing hospital, which is the first part of the organization to present any elements of permanence. The hospital is under canvas and has a normal capacity for several hundred, but, like all military hospitals, its service must be very flexible, capable of undertaking to succor in some way many times its accustomed number. One of our patients told me that a few months ago, after a now famous battle, he saw 5,000 wounded under the care of one of these institutions. Hundreds were on stretchers, but most of them were lying in a field on the ground without even the protection of a great coat or blanket. They were awaiting their turn for succor, and before they had been there long, hot soup for their stomachs and sterile dressing for their burning wounds would appear from somewhere. Thus one can understand that after a period of stress, either offensive or defensive, the pressure on these hospitals is enormous, so much so that the wonder of the whole situation is not that the service becomes congested but that it is possible at all to "sort" the cases. The casualty clearing hospital, as its name implies, is really a sieve from which patients are distributed to hospitals in the rear. In feverish haste the wounded are rushed back, back, back anywhere to a place of comfort and at the same time relieving the stress on the casualty clearing hospital. Those but slightly injured are treated at this hospital and sent back to the line. Those who are severely stricken by wounds or disease are sent down to the larger and less mobile hospitals, which are able to render more appropriate treatment.

Naturally enough, the extent of injury or illness is really the determining factor which sends a man back to the front or to a stationary, general or base hospital or, joy be, perhaps to "dear old Blightey" (England in the vernacular of the trenches). The first few days of the rush after an

engagement are always the most satisfactory from the doctor's view, for in it the wounds are almost all clean and the cases are in pretty good shape. But as time goes on and the dregs of the deadly business come filtering in, the state of the wounds gets worse.

In reality, these hospitals are little more than rest camps, for most of the patients never see a bed but remain on their litters during their stop, and none remain longer than seven days. A few nursing sisters are attached to these hospitals. By the way, these women are the only military women anywhere near the front, and they are miles and miles away from it. As already stated the casualty clearing hospital is a rest camp where wounds are dressed, good hot nourishing meals are served and cases sorted for final distribution. In comparison with other branches of the system, the casualty clearing hospital is a crude sort of place, but it is a cog necessary for the smooth efficiency of the great system.

The next link in the service is the ambulance train, which connects the casualty clearing hospital with the hospital farther removed from active operations.

The main business of war, however, is to kill, and for that purpose wounded soldiers are a drug on the market. The moment they are out of a job, they are in the ranks of the unemployed. With this conception of the enterprise in mind, it may be understood why the first considerations of the transportation system—the next link—is not for broken and useless humanity. It must stand aside for the ever needful "munitions of war" men, ammunition and food and all the trappings thereto. Those who have "done their bit" must make way for those who are on their way to do theirs.

Thus the transference of wounded from the front to the rear is not so much a matter of the needs of the patients as of the requirements of that mystic and voracious district—the front.

In the early days of the conflict—those days of stress on the British line—these trains had to yield precedence at every turn to troop trains. The ambulance trains would run a few miles, back onto a siding and wait, wasting hours while wounds cried out for dressings and men sick unto death lacked proper treatment. But the dispatch of these trains has improved much in the year, so that now within a few hours after departure the trains arrive at their destination, usually a general hospital about 50 miles from the front. Synchronously with the departure of the train a telephone message is sent from the casualty clearing hospital to the chief of the medical district to which the train has been assigned who, in turn, advises the hospitals in his zone to prepare for the reception of a convoy. These vestibuled trains are more than palatial ambulances on wheels—they are hospitals. They are equipped to serve meals and to perform emergency operations. The trains carry a staff of about thirty-five officers, nurses and orderlies, and have accommodation for about 300 lying down patients or 400 sitting up. The usual rate of unloading is 225 stretcher cases in the hour. The atmosphere of the ambulance train is one of cheerfulness, save for the silent dark coaches where lie the grievously stricken. You see, the boys are in hopes that they are bound for a sea-port town which in the near future will mean England.

One day we walked down by the quay where the spars stick up lone and thin, down among the fisher-folk of Picardy with their sabots and corsets (arm-pit high) and the smocks of the old men. For the first time we saw an ambulance train unload. A long siding had been built, and on this the train had been switched from the main line of the ———— Railway. A very long line of ambulances, of course all motor, was arranged along the dry clean gravel path, and these were quickly, quietly, and, be it said, gently filled with stretcher-cases by the Royal Army Medical Corps men under the direction of sisters and officers.

The poor Tommies fresh from the trenches were a pretty depressed lot. We waved to some and smiled to others, but no response was forthcoming. They were grimy and tanned brown, a severe contrast to their swathings. The boys were fagged out from their slow journey from the line. The drivers were without exception very careful of their charges. I must record, however, the very sympathetic behavior of the one woman driver. She handled her car so carefully and easily and treated those boys just as though they were her own. This incident inclines me to think that skilful women drivers would be just about the best for that sort of work.

On our way out we passed some American nurses in their pure white uniforms (they have taken over a hospital nearby and fly the Red Cross, Union Jack and Stars and Stripes). We were fortunate to get a ride on one of the laden ambulances bound for our camp. The villagers were awed as we whizzed through their sleepy street. The old curé stood with uncovered head as the car with the Red Cross passed him. The Tommies off duty removed their pipes and gaped quietly after us.

When the ambulances arrive at their hospitals they are quickly unloaded, and the patients are taken to the admission tent, examined and assigned to their wards. Thus this stream of broken humanity flows from its source (in the trenches) to the sea.

Prof. William Osler is visiting us now. His son is attached to our hospital and is a most likable young fellow —a sophomore from Oxford, by the way.

As I write we are awaiting a convoy, and I am on the "reception squad" tonight, that is, I am one of the youths who stay around, maybe half the night, taking stretcher cases out of ambulances and conducting walking cases to the various wards.

BERLIN LETTER

BERLIN, Sept. 7, 1915.

Personal

Professor Gocht of Halle has been appointed to succeed the late Professor Joachimsthal as director of the orthopedic clinic of the university in Berlin.

Professor Piper, extraordinary professor of physiology, director of the division of physiology in the university institute and surgeon with the troops in the field, died on the field of battle, aged 38 years. His researches were conducted largely in the physiology of the organs of sense. He made some remarkable investigations in optics and acoustics and published interesting observations on the relationship between the physiology and psychology of the mind.

The War

EMPLOYMENT OF WOMEN PHYSICIANS

Female physicians will no longer be employed in the hospitals connected with the army medical department. The reason for this action is the fact that there is a sufficient number of male physicians available for such service, and that the female physician can be employed to better advantage at home in the care of women and children. It is quite likely that personal misunderstandings may have been in part responsible for this action of the army board.

HEALTH OF SOLDIERS

According to recent official reports, the health of the troops is entirely satisfactory in the West as well as in the East. The soldiers have been singularly free from extensive epidemics. Typhoid occurs in the West only very infrequently, much less so than a year ago. This must be ascribed to the improved hygienic and sanitary conditions now prevailing in the enemy's territory and the improved methods of living. Every effort has been made to provide the troops with suitable drinking water. Three hundred transportable drinking-water apparatuses, which furnish about 800 liters of cool, palatable and healthful water, have been furnished for this purpose. Each apparatus clarifies, sterilizes, cools and reaerates all kinds of water, thus making it suitable for drinking purposes. Where such an apparatus is not available, the sanitary authorities aim to lessen, if not prevent entirely, the dangers of poor drinking water. Some supplies are stopped entirely, others are improved by bettering the condition and locations of wells and by adding chemical substances to the water, making it potable. The medical corps is continually on the lookout for individual cases of diarrhea, and when found these patients are immediately isolated and the spread of any infection thus prevented. These measures are carried out not only with the troops, but also with the civil population in the enemy's country. Experienced sanitarians can be commanded in sufficient numbers to aid and further this work, not only by giving advice and counsel, but by placing their laboratories at the disposal of the army authorities. The medical corps is convinced that the generally employed vaccination against typhoid has done much to lessen the number of cases of this disease. During the period of mobilization of the troops, typhoid inoculation could not be done as well as it has been done since. All the troops have now been vaccinated, and the soldiers in training at home are vaccinated before they leave for the front.

CHOLERA IN THE EAST

In the East, particularly east of the Weichsel, cholera has spread rather rapidly among the civil population, and after

the Russian evacuation of any city the German military doctors find many cholera patients, but the spread of the disease is very promptly checked by the measures employed elsewhere for the same purpose. Thus far cholera has not become epidemic. Of great value in the prevention of intestinal diseases has been the establishment of tearooms in all cities, towns and villages through which the soldiers pass on their way to the fighting front. Tea is prepared in large quantities in these places so that every soldier can have as much as he can drink. The fact that the troops have all been vaccinated against cholera must be accepted as one of, if not the principal reason, for the failure of the disease to become epidemic. Although the persons who have been vaccinated have not invariably received full protection against cholera, still, when they have contracted the disease, it has been in mild form only, with a rapid and uneventful convalescence.

Typhus fever is no longer a cause for apprehension. Every provision possible is being made at the front to provide opportunities for bathing and disinfection of clothing. If permanent bathing facilities cannot be had, temporary arrangements are made of which the soldiers can avail themselves. More than 100 bathing wagons drawn by horses are used for this purpose. They can be moved easily from place to place. Transportable laundries have also been provided in considerable numbers. Four hundred steam disinfection apparatuses are also in use. Wherever possible, provision is made to disinfect clothing, freeing it from lice and other vermin. In short, the measures employed to prevent the occurrence of typhus epidemics are now so far-reaching that little fear need be entertained with regard to this disease ever becoming epidemic. The control of tuberculosis, genito-urinary diseases and nervous and mental diseases is very gratifying.

LONDON LETTER

LONDON, Sept. 17, 1915.

The War

THE SUPPLY OF ARMY SURGEONS

The difficulty in obtaining a sufficient number of surgeons in the new armies still continues. As a consequence the age limit has been extended for home service from 50 to 55 years, and for foreign service from 40 to 45. Men who are over 55 and fit for additional work or some form of medical practice differing from what they are doing at present have been told that they can best serve their country by doing the work of younger men and releasing them for foreign service. The War Emergency Committee of the British Medical Association is working in cooperation with the War Office for the purpose of obtaining army surgeons. At its last meeting one of the suggestions made was to import physicians from America. The question of approaching the various government departments to release physicians under 45 now employed in various ways such as health officers, and educational medical officers, was also suggested.

THE INDIAN WOUNDED: PROVISION FOR THE PRESERVATION OF CASTE

The hospital at Brighton for the Indian wounded accommodates over 2,000 patients and differs in many ways from the ordinary military hospital. It is run by officers of the Indian Medical Service, assisted by a staff of assistant surgeons belonging to the Indian Subordinate Medical Department (which consists of natives and Eurasians), Indian nursing orderlies, storekeepers, water-carriers, sweepers, and others, numbering about 400. There is no female assistance, even laundry work being done by Indian washermen, especially brought over for the purpose. Many provisions have to be made so that the various castes can observe their customs which to them are of the highest importance. There are eight different kinds of diet and separate cookhouses for six different classes. The food of the patients is cooked in twenty-one cookhouses in the hospital grounds, and that of the subordinate staff in sixteen cookhouses. The Hindu cooks must in all cases be of the same or of a higher caste than the patients for whom they cook. The chief article of diet of all the fighting races in India is a kind of bread made from partially husked grain ground by hand between two slabs of stone. As regards meat all Mohammedans eat beef, but the practice is very abhorrent to Hindus, who regard the cow as a sacred animal. For this reason no beef is allowed in the hospital. Bacon and similar meat is also strictly prohibited. As Indians must themselves slaughter the sheep which they use for food, and they must do it in the special manner enjoined by their religious sects, they have to provide in the grounds of the county abattoir a new slaughter-house for this purpose. For Hindus the custom is to sweep the head of the animal off the neck with only one stroke of a talwar or sword, while for Mohammedans the mouth of the animal is pointed toward Mecca. As an Indian must bathe the greater part of the body before each time of prayer and a good Mohammedan must pray five times daily the amount of water used in the hospital averages between 60 and 70 gallons per head per day.

A YEAR'S CASUALTIES

The British casualties for the first year of the war are as follows: killed, died of wounds, etc., 70,992; wounded, 241,086; missing, 53,466; total, 365,544.

FOOD PRICES

Some time ago your Berlin correspondent gave some figures from a Swiss journal on the increase of food prices in this country since the war and compared them with the increase in Germany to the disadvantage of this country. They did not seem to be accurate. I am now pleased to be able to give official figures, both British and German, which show, as might be expected in consequence of the almost total cessation of her foreign trade, that the increase in Germany is the greater. According to the *Board of Trade Labour Gazette*, the general level of prices as compared with a year ago is about 23 per cent. higher, while the average increase in food prices, making allowance for their relative importance in working class houses, may be put at about 35 per cent. The latest available data concerning retail food prices in Berlin, published in the official Prussian *Statistische Korrespondenz*, show that, after a sharp rise in the first month of the war, prices declined somewhat last September, but from that month moved steadily upward until July, in which month they reached a figure representing an increase of nearly 70 per cent. on the prices of July, 1914. In Vienna, taking food prices in July, 1914, as equal to 100, the index number in July this year was 178.6. The rise in food prices in the early months of the war was much less marked in Vienna than in Berlin; in the second six months, on the other hand, the upward movement was considerably more pronounced.

PARIS LETTER

PARIS, Sept. 16, 1915.

The War

MEASURES AGAINST MALINGERING IN THE ARMY

The attention of the minister of war has again been drawn to the instances of voluntary mutilation which tend to multiply among men in the army. Some soldiers have not hesitated to produce diseases in themselves in order to escape the performance of their duty. Thus there have been observed cases of jaundice caused by ingestion of picric acid, cases of facial dermatitis produced by the use of irritating substances and cases of conjunctivitis produced by the application of certain powders. To put an end to these reprehensible practices, the minister recommends the application of severe penalties. Voluntary mutilation and the production of disease by a soldier in himself for the sake of escaping his duty is to be punished as a case of refusal to obey or abandonment of a post of duty.

CANNED MEAT IN THE DIET OF THE ARMIES IN THE FIELD

M. A. Kling, doctor of science and director of the municipal laboratory of Paris, and M. G. Hinard, an engineer-chemist, who occupy two important positions in the Division des Conserves du camp retranché de Paris, have just published in the Revue scientifique a very interesting study on canned meats and their utilization in the rations of the armies in the field.

In the entrenched quarters of Paris, two procedures have been employed for the manufacture of canned beef. The first is the procedure well known under the name of Appert or Chevallier-Appert and used in times of peace for army rations. It consists essentially in "blanching" the meat, that is, in giving it a preliminary partial cooking before putting it in the cans. The liquor from this cooking is concentrated so that it jellies on being cooled and is put into the cans with the meat. This blanching is less for the purpose of cooking the meat than for its partial evaporation. The meat loses from 40 to 45 per cent. of water during

the process, and is therefore a much more concentrated food than raw meat. The cans, which ought to contain 240 gm. of meat and 60 gm. of concentrated broth each, are immediately placed in an autoclave, where they remain for an hour and a half at a temperature of from 115 to 120 C.

This method, although quite rational, has serious practical disadvantages. For one, it requires a special apparatus for the cooking of the meat and the concentration of the broth. Such apparatus is found in few of the canning factories in France, which are devoted chiefly to the canning of vegetables rather than to that of meat. For this and other reasons, the Division des Conserves du camp retranché de Paris has employed, since the beginning of the war, along with the Chevallier-Appert method, a similar method, which requires nothing but autoclaves in the way of special apparatus and which also has the advantage of economizing coal. This war method is known as the "improved Billancourt." Former experiments, made at the military experiment station of Billancourt (a suburb of Paris), showed that meat placed raw in the cans was sufficiently cooked in the autoclave, and that the product kept perfectly. This, which is known as the Billancourt method, was not adopted in commerce (1) because, since the meat was not previously cooked down so as to evaporate the water, the quantity of meat in the cans formed an insufficient ration, and (2) because, since the cooking was accomplished in the closed cans, the juices escaped into the can from the meat, giving the latter an unappetizing appearance and often being lost when the can was opened. The method, however, was reserved for use in time of war. When in August, 1914, the Division des Conserves du Service des Approvisionnements of the entrenched quarters of Paris, spurred by necessity, was obliged to find immediate means for production on a large scale, MM. A. Kling and H. Copaux, of this service, took up the study of the Billancourt method, and modified it as follows: In each can of 850 gm., in which had been placed 800 gm. of raw meat, there were placed 50 gm. of rice and 2 gm. of agar-agar with 10 gm. of salt for seasoning. The addition of rice increases the nutritive value of the product by the addition of carbohydrate; moreover, the rice absorbs from six to seven times its own weight of water or of the meat juice. The agar-agar helps to take up the excess of juice not absorbed by the rice. As in this method the cooking is accomplished at the same time as the sterilization, it is of course necessary to increase the duration of the heating.

While recognizing that canned meats are of great service in furnishing a nutritious ration in small volume and slight weight, MM. Kling and Hinard believe that it would be a good thing to substitute for canned meat a mixed preparation of meat and vegetables. It should be easy of preparation, similar, for instance, to the "improved Billancourt," in which the rice should be replaced by dried vegetables—beans, lentils, or split peas. Potato might be added as in the English ration.

MENTION FOR CONSPICUOUS GALLANTRY

Dr. Balthazard, agrégé professor at the Faculté de médecine de Paris, is at present a captain of artillery, and in that capacity he has been mentioned in the order of the day in the army for his work at the head of a battery of 155 in facilitating the success of the infantry.

LESIONS FROM ASPHYXIATING GAS

In response to various questions, the minister of war has announced that lesions from gas or other chemical products employed by the Germans shall give the injured persons the same rights, all other things being equal, as if they were the consequence of wounds of war properly so-called.

FILTERS ON WAGONS FOR THE ARMIES

The Touring Club of France has equipped about 100 filters mounted on wagons in accordance with studies made on the subject by the water service of main headquarters. Each wagon is drawn by two horses and carries a filter, an aspirating pump, a force pump, a decanting basin and a sterilization basin. Each draws and delivers 3,000 liters of water an hour. They are intended to be sent to rivers, canals and wells selected by the military authorities and thus will serve to supply the regimental water wagons.

A FRENCH HOSPITAL AT MILAN

The administration of the municipal council of Paris has just decided to devote 20,000 francs (about $4,000) to the foundation of a French hospital at Milan for wounded Italians.

Marriages

Frank Chalmers McClanahan, M.D., Viola, Ill., a medical missionary to Egypt, to Miss Helen Smith of Waverly, Ohio, September 15.

Henry Gerald Carroll, M.D., Salem, Mass., to Miss Estelle R. Wilz of Scranton, Pa., in New York City, recently.

Raymond John Cary, M.D., Tacoma, Wash., to Miss Marian Spencer Skeele at Monrovia, Calif., September 1.

Charles Truman Spencer, M.D., Webberville, Mich., to Miss Irene Eva Keyes of Marlette, Mich., September 28.

Clarence Guy Macer, M.D., Evansville, Ind., to Miss Jeanette Johnston of Oakland City, Ind., September 22.

Carlos LeRoy Russell Fuller, M.D., Windsor, Ont., to Miss Olive Marion Glendon of Toronto, September 18.

Winfield Scott Schley, M.D., New York City, to Miss Grace Marie Van Campen of Brooklyn, September 13.

James Thomas Morgan, M.D., St. Louis, to Miss Anna Elizabeth Phelon of Santa Ana, Calif., October 1.

Julian Carr Hardy, M.D., Lecompte, La., to Miss Hazel Beatrice Dodge of Elk Rapids, Mich., August 27.

Harry Pierce Reuss, M.D., Granite City, Ill., to Miss Ruth Hill of East St. Louis, Ill., October 5.

Harry Smith Howard, M.D., Albany, N. Y., to Miss Anna E. Jones of Granville, N. Y., September 15.

Horace Dinney, M.D., Boston, to Miss Harriet Cunningham of Brookline, Mass., September 17.

Emery Ernest Magee, M.D., Waterloo, Ia., to Miss Fay Vaughn of Bangor, Wis., September 15.

James Philip Dean, M.D., to Miss Maud Lee, both of Madison, Wis., September 20.

Charles E. Sisson, M.D., to Miss Bertha Vollman, both of Elgin, Ill., September 1.

Deaths

Erasmus D. Skinner, M.D. Berkshire Medical College, Pittsfield, Mass., 1858; aged 77; a member of the Medical Society of the State of New York and the New York and New England Association of Railway Surgeons; once president of the Queens County (N. Y.) Medical Society; coroner of Queens County in 1872, and for twelve years health officer of North Hampstead Township; physician and surgeon to the Mineola Home; died at his home in Mineola, N. Y., September 21, from heart disease.

Archibald Fowler Alexander, M.D. College of Physicians and Surgeons in the City of New York, 1895; aged 41; a Fellow of the American Medical Association and New York Academy of Medicine; a member of the staff of the Paterson (N. J.) General Hospital; for eight years a member of the board of education and for a long time a member and once president of the boards of police and fire commissioners; died at his home in Paterson, September 22, from cerebral hemorrhage.

Sydney B. Barham, M.D. Medical College of Virginia, Richmond, 1861; aged 77; a member of the Medical Society of Virginia; for more than fifty years a practitioner of Surrey County, Va.; for several terms representative from that county in the Virginia Legislature and for more than thirty years chairman of the county board of supervisors; died at his home in Runnymede, Va., about September 20.

George William Sims, M.D. Gross Medical College, Denver, 1897; aged 44; a Fellow of the American Medical Association; assistant surgeon of the Third Texas Infantry, U. S. V., during the Spanish-American War; was found dead in his office in San Antonio, Tex., September 16, from the effects of a gunshot wound of the brain, believed to have been self-inflicted, with suicidal intent.

Henry Smith, M.D. University of Michigan, Ann Arbor, 1859; aged 79; formerly a Fellow of the American Medical Association; a member of the Medical Society of Virginia; for several years surgeon in the United States Public Health and Marine Hospital Service; surgeon of Volunteers during the Civil War; died at his home in Norfolk, Va., September 18, from nephritis.

John Rollen Moore, M.D. American Medical College, Eclectic, St. Louis, 1888; aged 54; for many years a practitioner of Lapel, Ind.; a director of the Greenfield (Ind.) Banking Company and president of the Greenfield Ice and Fuel Company; died at his home in Greenfield, Ind., September 13, from heart disease.

William H. Krickbaum, M.D. University of Pennsylvania, Philadelphia, 1902; aged 37; a Fellow of the American Medical Association and a member of the staff of the Danville (Pa.) State Hospital for the Insane; died in the George F. Geisinger Memorial Hospital, Danville, Pa., September 21, from typhoid fever.

John Myrick Thompson, M.D. Jefferson Medical College, 1872; aged 64; of Ocala, Fla.; formerly a member of the Florida Medical Association; visiting physician and a member of the board of managers of the Marion Hospital, Ocala, Fla.; died in Jacksonville, Fla., about June 22, from heart disease.

Porter I. Mulholland, M.D. Toledo (Ohio) Medical College, 1902; aged 40; a Fellow of the American Medical Association; assistant surgeon Ohio Naval Militia and on duty on the training ship *Essex* during its cruise in August; died at his home in Toledo, Ohio, September 20, from typhoid fever.

Colin McDougall, M.D. Bellevue Medical College, 1878; aged 74; formerly a member of the Medical Society of the State of New York; for many years physician to the Actors' Fund; a member of the staff of the New York Nose, Throat and Lung Hospital; died at his home in New York, September 19.

John Merrick Bemis, M.D. University of Vermont, Burlington, 1893; aged 55; a member of the Massachusetts Medical Society; superintendent and physician in charge of Herbert Hall, Worcester, Mass.; well known as a neurologist; died at his home in Worcester, September 22, from nephritis.

David Hunt, M.D. Harvard Medical School, 1867; aged 70; formerly a practitioner of Boston and Worcester, Mass.; an authority on medical history, and a specialist on diseases of the eye and ear; died at the home of his daughter in Detroit, September 15, from cerebral hemorrhage.

John S. Wolff, M.D. Jefferson Medical College, 1853; aged 88; for more than sixty years a practitioner of the Shiloh section of Laurens County, S. C.; in 1892 and 1894 a member of the South Carolina Legislature; died at the home of his son in Laurens, S. C., September 18.

Elijah Andrew Covington, M.D. Medical College of the State of South Carolina, Charleston, 1868; aged 77; a Confederate veteran; for many years a druggist and hardware merchant of Wadesboro, N. C.; died at his home in Wadesboro, September 12, from acute gastritis.

Edward Alexander, M.D. University of Vienna, Austria, 1854; aged 85; for forty-five years a practitioner of El Paso; at one time contract surgeon in the Army at Fort Bliss and later United States quarantine officer; died at his home in El Paso, September 18.

James Porter Davis, M.D. Medical College of Georgia, Augusta, 1883; aged 65; a Fellow of the American Medical Association; formerly chairman of the Board of Health of Tennille, Ga; died at his home in Riddleville, Ga., September 7.

John Dickson, M.D. University of Maryland, Baltimore, 1852; aged 84; for many years a practitioner of Baltimore, but for the last quarter of a century a resident of California; died at his home in San Francisco, September 15, from senile debility.

Simeon Dosson Taylor, M.D. Vanderbilt University, Nashville, Tenn., 1887; aged 53; a member of the Kentucky State Medical Association; a practitioner and druggist of Beaver Dam, Ky.; died at his home, August 2, from typhoid fever.

Arthur W. Parker, M.D. College of Physicians and Surgeons, Keokuk, Iowa, 1881; aged 61; died at his home in Essex, Iowa, September 6, from carcinoma of the stomach and liver.

Samuel Lafayette Weed, M.D. University of Alabama, Mobile, 1886; aged 56; of Helena, Ala.; died in an infirmary in Birmingham, Ala., September 9.

William A. Settle, M.D. University of Louisville, Ky., 1877; aged 65; died at his home in Greensburg, Ky., September 14.

Correspondence

Sign for Distinguishing Gaseous Distention from Appendicitis

To the Editor:—I have on several occasions noted a sign which appears to be of value in differentiating between acute appendicitis and simple gaseous distention of the cecum associated with acute bowel fermentation. So far as I know the sign has never been described. It is elicited as follows:

Gentle pressure is brought to bear over the cecum, pressing in an upward direction. If the condition is simply gaseous distention, the patient will complain of pain in this region, but also complains of pain in left hypochondrium; pain disappears when the pressure is relieved. The explanation appears to be this: The enormous quantity of gas in the cecum is forced upward by the pressure, passing along the ascending and transverse colon, but is caught at the acute splenic flexure. The sharp impact of the gas here causes pain. This sign has on several occasions been of value to me and prevented operation in doubtful cases.

S. SALZMAN, M.D., Toledo, Ohio.

Emetin: A Warning

To the Editor:—Those using emetin solutions should be very careful not to get any in the eyes. This accident is followed by a very severe reaction. There is no pain at first, but in about eight hours there is an uncomfortable, "scratchy" feeling, intense photophobia and lacrimation, with conjunctival and some circumcorneal injection. Duration is about two days. To date I have seen two cases. A detailed report of these cases will be published later.

JULIAN B. BLUE, M.D., Memphis, Tenn.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

LUETIN TEST—DIONIN IN CATARACT

To the Editor:—1. Can you advise me regarding the reliability of the luetin test which is now being marketed commercially? Has any comparison been made between that and the Wassermann and Noguchi tests?

2. Can you express an opinion on the treatment of cataract by the use of dionin (ethyl-morphin hydrochlorid), either in the conjunctival sac or by subconjunctival injection, or by the use of any form of electric current? Is there any recent literature on these subjects?

E. B. J.

ANSWER.—1. The luetin test is described on page 334 of New and Nonofficial Remedies, 1915. Numerous references occur in the literature to comparisons of results with this test and with the Wassermann and the Noguchi modification of the Wassermann. The article in New and Nonofficial Remedies says:

"Luetin is employed for the diagnosis of syphilis. It is of use in the examination of tertiary cases but rarely gives a positive reaction in the primary cases or in untreated secondary cases. In patients who are under treatment by mercury or salvarsan, the reaction is frequently positive even in cases which fail to give a positive Wassermann reaction."

2. The nonoperative treatment of cataract has occupied the attention of ophthalmologists from the earliest times, both before and since its pathology was understood. It is true that in some cases of genuine cataract the opacity has disappeared without treatment, and it is not uncommon to see the disappearance of diabetic striae and the occasional absorption of exudates between the fibrillae of the lens which have produced more or less cloudiness. Attempts have been made to cure this condition by the employment of various drugs, massage with various ointments, the use of galvanism, the subconjunctival injection of potassium iodid, dionin, mercury, etc. In cases of incipient senile cataract a number

of ophthalmologists have reported good results in delaying the development of opacities by the subconjunctival injection of potassium iodid combined with the use of dionin powder insufflated into the conjunctival sac. The great majority of cases of cataract, however, are progressive and show no improvement under any form of local treatment; when useful vision is lost a surgical operation is the only treatment. Volumes II and III of "The American Encyclopedia of Ophthalmology" contain a complete summary of this subject, with bibliographic references to the most recent literature.

REFERENCES ON SOCIAL MEDICINE

To the Editor:—I am interested in the subject of social medicine. Please give me some data as to where I can obtain literature on this subject.

W. L. Albin, M.D., University Place, Neb.

Answer.—The following list of references may be consulted on this subject:

A State Medical Service, The Journal, Jan. 31, 1914, p. 391.
Socialization of Medicine in England, The Journal, Jan. 24, 1914, p. 316.
Warbasse, J. P.: Socialization of Medicine, The Journal, July 18, 1914, p. 284.
Bevan, A. D.: Medicine a Function of the State, The Journal, March 14, 1914, p. 821.
The Insurance Conflict, The Journal, Feb. 14, 1914, p. 549.
Benefits of the British Insurance Act, The Journal, July 26, 1913.
A New Form of Insurance in England, The Journal, Jan. 22, 1909.
Medical Men: Their Place and Influence in the State, *Brit. Med. Jour.*, Feb. 14, 1914.
Industrial Insurance in Germany, The Journal, March 28, 1914, p. 1039.
The Place of Medical Men in the Modern State, The Journal, April 4, 1914, p. 1112.
The National Insurance Act and Scarcity of Physicians, The Journal, Jan. 17, 1914, p. 218.
Medical Remuneration Under the Insurance Act, The Journal, March 21, 1914, p. 945.
Mr. Lloyd-George on the Insurance Act, The Journal, March 7, 1914, p. 789.
Carroll, J. B.: Workmen's Compensation Law and the Physician, *Boston Med. and Surg. Jour.*, Jan. 1, 1914.
French, J. R.: Medical Situation of New Workmen's Compensation Act, *California State Jour. of Med.*, April, 1914.
Oliver, T.: Medico-Social Problems from an Insurance Point of View, *Lancet*, London, April 4, 1914.
Rogers, B. M. H.: Experiences of Medical Adviser Under Insurance Act, *Brit. Med. Jour.*, June 28, 1913.
Rowntree, C.: Workmen's Compensation Act and Physician, *Practitioner*, August, 1913.
Merrick, R. M.: Workmen's Compensation Act as It Affects Physicians, *Boston Med. and Surg. Jour.*, Sept. 18, 1913.
The Crisis in Germany, The Journal, Dec. 13, 1913, p. 2163.
Medical Insurance Abroad, The Journal, Dec. 27, 1913, p. 2314.
Benefits of the British Insurance. The Journal, July 26, 1913, p. 296.
Social Insurance (Excerpts from the report of the Judicial Council submitted to the House of Delegates at San Francisco, June 21, 1915), *Am. Med. Assn. Bull.*, May 15, 1915.

BINET-SIMON TEST—HEALY TEST—D'ESPINE SIGN—KORANYI SIGN—EWART SIGN

To the Editor:—Please describe for me: (1) the Binet-Simon test of mentality; (2) the Healy psychologic test; (3) the D'Espine sign; (4) the Koránvi sign, and (5) Ewart's sign.

C. R. Byers, M.D., Bay City, Texas.

Answer.—1. The inquiry regarding the Binet-Simon test was answered in The Journal, Jan. 13, 1912. This series of tests is published in a pamphlet by A. Binet and T. Simon, entitled "A Method of Measuring the Development of the Intelligence of Young Children," published by the Courier Company, Lincoln, Ill.; price, $1. A list of the recent literature on this subject was published in The Journal, Jan. 10, 1914. The series of questions and problems in this test are too extensive for publication in this department.

2. The Healy psychologic test is described in a monograph by William Healy and Grace Fernald, published by the Psychologic Review Publishing Company, Princeton University, Princeton, N. J.

3. In 1907, D'Espine (*Bull. de l'Acad. de méd.*, Paris, 1907, lxii, 167) drew attention to a sign which he considered diagnostic of enlargements of the bronchial glands. He stated that in young children the whispered voice normally ceases at the level of the seventh cervical spine posteriorly. When, however, there is enlargement of the lymph nodes and the patient whispers "three thirty three," or similar numbers, bronchophony is heard over the upper thoracic spine as well. A recent study of this sign has been made by H. F. Stoll ("The Diagnostic Significance of D'Espine's Sign," *Am. Jour. Dis. Child.*, September, 1915, p. 183.

4. Koránvi's sign is the same as Grocco's sign. In a medium-sized pleural effusion an S-shaped dulness can be determined as the upper limit of the effusion. The line begins rather low down at the spine, curves upward and obliquely across the chest into the axilla, then descends to the sternum. Movable dulness may be determined with changes in the patient's position. A triangular area of dulness may be found on the opposite side of the effusion. The base is at the level of the lower border of the lung and the apex about the height of the upper level of dulness. This latter finding is known as Grocco's sign. The presence of a normal triangular area of paravertebral dulness diminishes the diagnostic value of this sign. Reference may be made to Musser, "Medical Diagnosis," p. 604, and F. Smithies; (*Arch. Diag.*, April, 1912; Abst., The Journal, June 22, 1912).

5. Ewart's sign is of importance in the diagnosis of pericardial effusion. It is the prominence of the sternal end of the left first rib with elevation of the head of the clavicle.

ULTRAVIOLET RAYS AND INCANDESCENT ELECTRIC LIGHTS IN INFLAMMATORY CONDITIONS

To the Editor:—1. What candle power of incandescent electric lights produces the most ultraviolet rays?

2. What is the value of the ultraviolet rays so produced, for the treatment of acute inflammations like cellulitis, and for deep-seated chronic inflammations?

C. D. E., Oregon.

Answer.—1. The incandescent electric light produces few ultraviolet rays. Its spectrum contains not nearly so many ultraviolet rays as the arc light. The greatest quantity of ultraviolet rays is produced by incandescent mercury vapor in the mercury vapor lamps of the Cooper-Hewitt type. In order to get a large number of these rays for therapeutic purposes these mercury lamps must be made of quartz, which permits the passage of nearly all violet and ultraviolet rays. Glass absorbs a great quantity of these rays.

2. Ultraviolet rays penetrate tissue only slightly—not more than one-half inch—when the tissues are compressed so that they are almost bloodless. They scarcely penetrate blood at all. It is difficult to see how ultraviolet rays can be of any therapeutic value in treating any sort of process not near the surface of the skin. In the so-called ultraviolet lamps in which the source of light is an incandescent electric light, usually backed by a parabolic reflector, all the effects that can be obtained from light are on the surface. Because of the absence of ultraviolet rays in this light, it is probable that its physiologic effect is inappreciable; whatever therapeutic powers such lamps possess are perhaps due to the heat given off by them, which, in the case of incandescent lights, is considerable.

MORTALITY FROM RATTLESNAKE BITES

To the Editor:—Will you kindly inform me regarding the relative mortality from rattlesnake bites?

R. N. Pierson, Stamford, Conn.

Answer.—Prentiss Willson, in a very complete article on the general subject, which includes a summary of the literature (Snake Poisoning in the United States, *Arch. Int. Med.*, June, 1908, p. 516), says:

"The mortality from the bites of American serpents has never been satisfactorily determined. Mitchell, in 1860, stated that in 57 cases of rattlesnake bite mentioned in the literature, five patients died. This would represent a mortality of 8.7 per cent. Elzey, whose opinion is often quoted, merely estimated that in 15 per cent. of cases of rattlesnake bite in adults, the patients would die, if left untreated. Barringer stated his belief that the mortality from rattlesnake bite would not exceed 10 per cent. and from copperhead bite 1 per cent. The mortality from water moccasin bite, he thought, would fall below even this last figure. There were 78 fatal cases in the total of 740 which I have collected, a mortality of 10.5 per cent. This figure represents the mortality of all species combined, and in my opinion may be accepted as representing with considerable accuracy the actual mortality attending snake bite in the United States, the number of cases on which it is based being considerable, and having been collected from sufficiently varied sources. As tending to prove the accuracy of this rate, it may be stated that the mortality rates for cases collected from the literature and from various private sources were, respectively, 10.2 per cent. and 10.7 per cent., a variation of only 0.5 per cent. The mortality rate for the different species will be given later in considering the effect of species on the prognosis."

In a tabulation of 624 cases of snakebite, in which the species were known more or less definitely, Willson found a mortality rate for all rattlesnake cases of 11.7 per cent. This he considers approximately correct.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARKANSAS: Regular, Little Rock, November 9-10. Sec., Dr. T. J. Stout, Brinkley. Homeopathic, Little Rock, November 11. Sec., Dr. Scott C. Runnels, 900 Scott St., Little Rock.

CONNECTICUT: Regular, New Haven, November 9-10. Sec., Dr. Charles A. Tuttle, 196 York St., New Haven. Homeopathic, New Haven, November 9. Sec., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven. Eclectic, November 9. Sec., Dr. T. S. Hodge, 19 Main St., Torrington.

DISTRICT OF COLUMBIA: Washington, October 12. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington.

GEORGIA: Atlanta, October 12. Sec., Dr. C. T. Nolan, Marietta.

ILLINOIS: Chicago, October 13-15. Sec., Dr. C. St. Clair Drake, Springfield.

IOWA: Des Moines, October 19-21. Sec., Dr. Guilford H. Sumner, State House, Des Moines.

KANSAS: Topeka, October 12-14. Sec., Dr. H. A. Dykes, Lebanon.

MAINE: Portland, November 9-10. Sec., Dr. Frank W. Searle, 776 Congress St., Portland.

MICHIGAN: Lansing, October 12-14. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.

MISSISSIPPI: Jackson, October 26-27. Sec., Dr. E. H. Galloway, Jackson.

NEBRASKA: Lincoln, November 10-11. Sec., Dr. H. B. Cummins, Seward.

NEVADA: Carson City, November 1. Sec., Dr. Simeon L. Lee, Carson City.

NEW JERSEY: Trenton, October 19-20. Sec., Dr. G. H. Norton, 430 E. State St., Trenton.

OKLAHOMA: Oklahoma City, October 12. Sec., Dr. Ralph V. Smith, 502 Daniel Bldg., Tulsa.

SOUTH CAROLINA: Columbia, November 9. Sec., Dr. A. Earle Boozer, 1806 Hampton St., Columbia.

TEXAS: Dallas, November 9-11. Sec., Dr. M. P. McElhannon, Belton.

WEST VIRGINIA: Elkins, November 9. Sec., Dr. S. L. Jepson, Charleston.

WYOMING: Laramie, October 13-15. Sec., Dr. H. E. McCollum, Laramie.

North Carolina June Report

Dr. H. A. Royster, secretary of the Board of Medical Examiners of the State of North Carolina, reports the oral and written examination held at Greensboro, June 8-11, 1915. The total number of subjects examined in was 13; total number of questions asked, 70; percentage required to pass, 80. The total number of candidates examined was 134, of whom 104 passed and 30 failed. Thirty-two candidates were licensed through reciprocity. Two nongraduates were granted limited licenses. The following colleges were represented:

PASSED		
College	Year Grad.	Total No. Licensed
Southern College of Medicine and Surgery	(1912)	1
Chicago College of Medicine and Surgery	(1912) (1913)	2
University of Louisville	(1915)	1
Baltimore Medical College	(1907)	1
College of P. and S., Baltimore	(1914, 2) (1915)	3
Johns Hopkins University	(1907) (1915, 2)	3
University of Maryland	(1912) (1914) (1915, 10)	12
Columbia Univ., College of P. and S.	(1911) (1915, 4)	5
Leonard Medical School	(1913, 4) (1914, 2)	6
North Carolina Medical College	(1913) (1914, 3) (1915, 17)	21
Jefferson Medical College	(1915)	12
Medico-Chirurgical Coll. of Phila.	(1915, 2)	2
University of Pennsylvania	(1914) (1915, 4)	5
Woman's Medical College of Pennsylvania	(1914) (1915)	2
Medical College of the State of S. C.	(1915)	1
Chattanooga Medical College	(1908)	1
Meharry Medical College	(1915)	3
Lincoln Memorial University	(1915)	1
University of West Tennessee	(1912) (1915, 2)	3
Medical College of Virginia	(1913, 2) (1914) (1915, 15)	18
University of Virginia	(1915)	1

FAILED		
Atlanta Medical College	(1914)	1
College of P. and S., Keokuk	(1877)	1
University of Louisville	(1914)	1
College of P. and S., Boston	(1911) (1914)	2
Leonard Medical School	(1911) (1912)	2
N. C. Med. Coll.	(1905) (1912) (1913) (1914, 2) (1915, 2)	7
Medico-Chirurgical College of Philadelphia	(1898)	1
Medical College of the State of S. C.	(1901) (1911)	2
Chattanooga Medical College	(1903)	1
Lincoln Memorial University	(1911)	1
Meharry Medical College	(1915)	1
University of the South	(1905) (1909)	2
University of West Tennessee	(1914) (1915, 3)	4
Medical College of Virginia	(1914) (1915, 3)	4

LICENSED THROUGH RECIPROCITY		
College	Year Grad.	Reciprocity with
University of Alabama	(1908)	Alabama
University of Colorado	(1906)	Colorado
Howard University	(1909)	S. Carolina
Atlanta Medical College	(1884)	Georgia
University of Georgia	(1911)	Georgia
College of P. and S., Chicago	(1910)	Illinois
Kentucky School of Medicine	(1905)	Kentucky
Tulane University of Louisiana	[illegible]	Louisiana
Johns Hopkins University	(1912)	Maryland
University of Maryland	(1902, 3) South Carolina, Pennsylvania, Virginia; (1909) South Carolina; (1911, 2) Maryland, South Carolina; (1912) South Carolina; (1913, 2) Maryland.	
University Medical College of Kansas City	(1911)	Kansas
Columbia Univ., Coll of Phys. and Surgs.	(1912)	New York
Cornell University	(1912)	New York
Medico-Chirurgical College of Phila.	(1906)	Penna.
Medical Coll. of the State of S. C.	(1886) (1905)	S. Carolina
University of Nashville	(1893)	S. Carolina
University of Tennessee	(1903)	Oklahoma
University of the South	(1899)	Georgia
Vanderbilt University	(1891)	Georgia
Medical College of Virginia	(1910)	Virginia
Univ. Coll of Med., Richmond	(1898) (1912) (1913)	Virginia

Illinois June Report

Dr. C. St. Clair Drake, secretary of the Illinois State Board of Health, reports the written examination held at Chicago, June 24-26, 1915. The total number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 200, of whom 177 passed and 23 failed, including 4 candidates who did not complete the examination. The following colleges were represented:

PASSED			
College	Year Grad.		Per Cent.
Bennett Medical College	(1913) (1914, 3)	(1915, 21)	25
Chicago College of Med. and Surg.	(1914, 2)	(1915, 26)	28
Hahnemann Med. Coll. and Hosp., Chicago	(1914, 2)	(1915, 9)	11
Jenner Medical College		(1915)	11
Northwestern University	(1914)	(1915, 12)	13
Rush Medical College	(1914)	(1915, 29)	30
University of Illinois	(1912)	(1915, 45)	46
University of Louisville	(1910)	(1915)	2
University of Maryland		(1915)	1
Harvard University	(1912)	(1915)	2
University of Minnesota		(1893)	1
St. Louis University		(1915)	2
Washington University		(1915)	1
John A. Creighton Medical College		(1911)	1
Meharry Medical College		(1915)	2
Catholic University, Louvain		(1895)	1

FAILED			
Bennett Medical College	(1914, 3)	(1915, 3)	6
Chicago College of Med. and Surg.	(1914, 2)	(1915, 3)	5
Chicago Hosp. Coll. of Medicine		(1915)	1
Hahnemann Med. Coll. and Hosp., Chicago		(1915)	2
National Med. Univ., Chicago		(1909)	1
University of Illinois	(1913)	(1915)	2
National Univ. of Arts and Sciences		(1914)	1
University of Pennsylvania		(1896)	1

Alaska July Report

Dr. H. C. DeVighne, secretary of the Alaska Board of Medical Examiners, reports the written examination held at Juneau, Alaska, July 6, 1915. The total number of subjects examined in was 12; total number of questions asked, 120; percentage required to pass, 75. The total number of candidates examined was 6, all of whom passed. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent.
College of P. and S., San Francisco	(1909)	76.3
University of Georgia	(1912)	80
Rush Medical College	(1889)	78
State Univ. of Iowa, College of Medicine	(1886)	75.8
University of Mich. Medical School	(1900)	77
Marion-Sims College of Medicine	(1898)	76.9

Arizona July Report

Dr. John Wix Thomas, secretary of the Board of Medical Examiners of Arizona, reports the written examination held at Phoenix, July 6-7, 1915. The total number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 9, of whom 5 passed, including 2 osteopaths, and 4 failed, including 2 osteopaths. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent.
University of Southern California	(1899)	78
Tufts College Medical School	(1906)	75.1
Medico-Chirurgical College of Phila.	(1902)	76.8

FAILED		
College of P. and S., San Francisco	(1913)	71.2
Vanderbilt University	(1914)	72.2

Book Notices

A MANUAL FOR HEALTH OFFICERS. By J. Scott MacNutt, A.B., S.B. Foreword by William T. Sedgwick, Professor of Biology and Public Health in the Massachusetts Institute of Technology. Cloth. Price, $3 net. Pp. 660, with illustrations. New York: John Wiley & Sons, 1915.

The increasing number of workers in the public health field, both physicians and laymen, has created a distinct demand for a compact, practical, up-to-date reference book for health officers. The fact that Mr. MacNutt's training was secured, not in a medical school, but in the Massachusetts Institute of Technology, has naturally influenced both his point of view and his method of treatment. The publication of such a volume by a nonmedical man is conclusive evidence of the way in which the entire public health field is widening. The book is divided into two main parts, the first dealing with health authorities, their organization and powers and the second with public health administration. Under the first head, local, state and federal health authorities and their functions are discussed; also unofficial organizations. In the section on public health administration, the greater part of the space is naturally devoted to the discussion of communicable diseases and methods for their prevention. Child hygiene, food sanitation, water supply and housing are also discussed. While the book is one of the best practical manuals for health officers that has appeared recently and while its perusal will be of marked benefit and interest to every one interested in public health administration, the lack of medical training on the part of the writer is evident throughout. Equally evident is the lack of familiarity with the large amount of material on public health questions to be found in the leading medical journals, most of the periodical references being to one or two journals. It is also noticeable that most of the material and information utilized in the volume is drawn from a few of the eastern states. Mr. MacNutt's book is worthy of careful study, but it is unfortunately limited in both its material and its point of view.

A TEXT-BOOK OF MEDICAL JURISPRUDENCE AND TOXICOLOGY. By John Glaister, M.D., D.P.H., F.R.S.E., Professor of Forensic Medicine in the University of Glasgow. Third Edition. Cloth. Price, $5 net. Pp. 857, with 138 illustrations. New York: William Wood & Co., 1915.

Dr. Glaister's work is now issued in two volumes, one on "Medical Jurisprudence and Toxicology" and the other on "Public Health." Since its last appearance, the book has been thoroughly revised and rearranged and a more complete and detailed index prepared. While it is naturally of greater value to the English reader because it applies to legal procedure in that country, yet the breadth of Dr. Glaister's experience and the large amount of data which he has collected must make this book of interest to all students of medical jurisprudence. Especially interesting are the chapters on "Personal Identity," "Finger Prints," "the Identification of the Dead," "Gunshot Wounds" and "Deaths by Lightning and Electricity." Poisons and poisoning are exhaustively discussed. The chapter on "Wounds and Their Medicolegal Relations" is well illustrated and illuminated by copious extracts from case reports. The microscopic and chemical identification of blood and other body fluids is also authoritatively considered. The third edition of this work is a marked improvement over the preceding editions.

THE EARLY DIAGNOSIS OF HEART FAILURE AND OTHER ESSAYS ON THE HEART AND CIRCULATION. By T. Stacey Wilson, M.D., F.R.C.P., B.Sc., Senior Physician, General Hospital, Birmingham. Cloth. Price, $4.50 net. Pp. 617, with illustrations. New York: William Wood & Co., 1915.

There are in this book several essays dealing with the heart and circulation. Most of them treat of heart failure. Had Wilson selected a few of his newer ideas, such as the "high diaphragm" or "diminution in the area of liver dulness" as signs of myocardial weakness, or the "distensibility of the heart wall," and emphasized these, omitting many of the trite facts as to physical examination of the heart and symptomatology of heart disease, his argument would have gained in effectiveness from concentration. As it is, even with his summaries and wearisome repetition, it is hard at times to make out what he is driving at. There is much that is suggestive in the book and it shows painstaking and conscientious study of an important subject along somewhat new lines. It is not always recognized that the heart that fails may in the one case enlarge, while in the other instance the lack of distensibility of the heart wall causes the organ to remain small. These and other points are well worth consideration by practitioners, for whom the book is primarily intended.

URGENT SYMPTOMS IN MEDICAL PRACTICE. By Robert Saundby, M.D., Lieutenant-Colonel, R.A.M.C. Cloth. Price, $2.10 net. Pp. 437. New York: Longmans, Green & Co., 1915.

Saundby has arranged alphabetically an indiscriminate list of subjects, covering not only what the title indicates, but other fields of medicine as well. He includes not only symptoms but many diseases and several pathologic tests. In the selection of the subjects covered there seems to be neither rhyme nor reason. No subject is covered completely. Such subjects as acne, alopecia, genital spots, immunity, keloid or paralysis agitans can hardly be listed as urgent. In the discussion of treatment the author is exceptionally free in his references to proprietaries, some ethical and others not so good. As a reference work to the things in it the book has a certain value.

Miscellany

"The Brides in a Bath" Case

The most sensational murder case in England since the Crippen trial has terminated in the conviction of George Joseph Smith, aged 43. The case is extraordinary in the annals of criminal jurisprudence, and presents several points of medicolegal interest. The prisoner contracted bigamous marriages with three women who soon afterward were found dead in a bath in very similar circumstances. The physicians who were called in, while rightly coming to the conclusion that death was due to drowning, were hoodwinked as to the cause, and thought that the death was accidental. The prisoner, a short time before each death, cunningly took the women to the physicians with the complaint of headache or fits, so as to facilitate the belief that death was due to natural causes. The deaths took place in lodging houses. After them he managed to slip out and return after buying food and pretended that he had just found the woman dead. The theory of the prosecution was that he pulled up the legs in such a position that the head would be submerged and the woman incapable of successfully struggling or screaming. In one case the physician thought that the woman had an epileptic seizure while in the bath and was thus drowned, but there was no proof, merely the prisoner's allegation, that she suffered from epilepsy. In another case the physician thought that the woman fainted from the heat of the bath and was drowned. The evidence of Dr. Spilsbury, medicolegal expert, was important. In the case of two of the baths he thought it was impossible for the head to be accidentally submerged so as to cause drowning. In one, while the woman's height was 5 feet 8 inches, the bath measured only 5 feet at the top, and 3 feet 8 inches at the bottom. In one case a piece of soap was found grasped in the hand after death. Dr. Spilsbury said that if the woman had fainted, the muscles would have been relaxed and the soap would have fallen out. If she had had a fit, it would probably have been retained in the first stage, but in the second or clonic stage would more likely have fallen out, and certainly would have fallen out in the third stage of exhaustion. He concluded, therefore, that consciousness was not lost before death, but that death was due to submersion, and that the contraction of the muscles passed into rigor mortis, causing the soap to be retained. It was never even proved that the prisoner was in the bath room at the time of death, and therefore the evidence was entirely circumstantial. The judge pointed out

the following series of coincidences in the circumstances of the three deaths, which were too many to be regarded as accidental: 1. In each case there was a death in a bath, and in each case the prisoner had moved to that bath room or fitted it up within a week before the death. 2. In each case the bath room in which the death took place was unlocked, so that the prisoner could go into it, although in two cases it was in a strange house and other lodgers might enter. 3. In each case the dead woman made her will in favor of the prisoner within a week before her death. 4. In two of the cases, the dead woman insured her life within ten days before her death; in the third case there was no insurance because there was considerable property which would pass on death. 5. In each case, all the debts due to the dead woman and all savings bank accounts had been realized just before death. 6. In each case, two or three days before the death the woman was taken to a strange physician in a strange place complaining of headache, and that physician was called in after death. 7. In each case, a letter was written to the woman's relatives a day before her death. 8. In each case, the prisoner had gone out to buy food when the woman was found drowned. 9. In each case, the prisoner found her, left her in the water until some one had seen her, and did not get rid of the water without permission. 10. In each case, it was a bigamous marriage. 11. In each case, he benefited more by death than by life. 12. In each case, he buried the woman as quickly as possible. It is to be noted that the evidence in any one of the three cases was so slight that the prisoner could scarcely have been put on his trial. Indeed, no suspicions were even aroused until the third case. Then the remarkable series of coincidences given above proved fatal to the prisoner.

The Pennsylvania Department of Health Exhibit at the Panama-Pacific International Exposition

The mammoth exhibit of the commonwealth of Pennsylvania is a credit to that state and to its commissioner of health, Dr. Samuel G. Dixon. The exhibit is surrounded on all sides with white pennants, each bearing an attractive green keystone; from the center beam and at each end are draped the Stars and Stripes, side by side with the blue silk flag of Pennsylvania. Almost the first thing that arrests the eye is the sentiment written by Dr. Dixon: "The varied industries on which we depend for our comfort, the wealth which enables us to enjoy them, and the arts of civilization which adorn and diversify our lives are but the fruitage of the tree whose root is health." The exhibit graphically portrays the activities of the department, roughly divided into three separate sections: school hygiene, typhoid fever and sanitary engineering, and the tuberculosis work of the department.

In the section on school hygiene are pictures showing the inspection of rural schoolchildren, of which Pennsylvania inspects approximately 400,000 a year. Statistics give the percentage of defects found under vision, hearing, teeth, nose and throat, skin diseases, nervous diseases and tuberculosis in all its forms. It is perhaps the only state in the union which has undertaken medical and sanitary inspection of rural schools on such a vast scale, under state supervision. The dangers of the common towel are made clear by life-sized wax models of pupils, the evolution of the sanitary drinking cup and fountain is illustrated, and good and bad seating facilities in schools are shown by life-sized wax models of boys and girls in actual seats placed at adjustable desks. Transparencies depict the progress and evolution of schoolhouses, from the old insanitary, unlighted country school to the modern, pleasant, well-lighted building. A model of an artistic school building and grounds and its screened outhouses suggests the ideal.

The division devoted to typhoid fever and sanitary engineering covers a large area. There are models of a complete sewage-disposal plant, and of towns and cities in which epidemics of typhoid fever occur. The manner and the source of infection are shown by miniature houses and the depiction of streams and leaky flumes, overflowing vaults, carelessness at dairy farms, inadequate care of sewage from trains and boats, and the pollution of streams by dead animals and outhouses.

No part of the exhibit has attracted more attention than that which portrays by models, pictures or transparencies the work of Pennsylvania for the care of consumptives, and the work that is going to educate the people for its prevention. Models are shown of Pennsylvania's three large sanatoriums which can accommodate approximately 2,000 patients afflicted with this disease. Types of cottages used at the "camp" and occupied by the patients in the incipient stages are reproduced with every detail, even to the miniature bed, bedclothes and wash basin in each room. The work of the visiting or dispensary nurse is shown by transparencies. The work of the new Bureau of Housing is also indicated, as well as that by the bacteriologic and pathologic laboratory, where all specimens are sent for examination.

Dr. Dixon and the exhibit were each awarded a gold medal.

The Undiagnosable

"It is one of the commonplaces of worldly wisdom not to try to educate the public. The business man will make his boldest bid to supply an already existent demand, or to create a demand for something that he wants to sell; but he is never supposed to succeed if he spends his time and money in getting the world at large to do what it ought, instead of allowing it to do what it often vainly imagines is to its own advantage. The medical profession can, to a certain extent, contradict this assertion; we are, spasmodically and vicariously, it is true, making the people at large put up with methods that are clearly not so satisfying to them as those that they replace, and not only that, but we are persuading people actually to prefer the more uninviting system. Nothing could have been more comforting to the world of sick in general than the old belief in the infallibility of the physician. To know for an absolute certainity that the whole case lay bare before one's medical adviser, as if he were gifted with a diagnostic combination of the Roentgen ray and clairvoyance which showed him all the iniquities of the peccant organism like an open book, must have been a boon that contributed not a little to the peace of mind, and so indirectly, to the more rapid recovery of the patient. But it was not true.

"It may be argued that that was but a detail. If the application of the false is a suitable therapeutic agent, why should we go out of our way to avoid it when in addition it offers all the additional advantages of being the path of least resistance? We may tell ourselves that if our patients do not suffer by a little undue dogmatism and unjustifiable confidence on our part, we have done them no harm, and have at any rate, sustained our own reputation. We forget the harm we do to ourselves. Slipshod untruth is unscientific. We need not refer to its ethics. It is in the wrong spirit. Its practice makes us only too ready to repeat it out of sheer laziness. And the next thing is that we find ourselves dividing cases into those of M. F. S., Mist. Carm., Mist. Expect. Sed., and so on, which is obviously fatal to anything but a commercial success in the practice of medicine. It is to our credit that we have educated so many of our patients to look on us as fallible, as people like themselves, to whom mistakes are possible and who do not know everything. Such a spirit is the right one if we wish for the real advancement of medicine, and, as a sop for Cerberus, it pays in the long run."—*Medical Press and Circular.*

The Engineer in Public Health Work.—There are certain good reasons for the evolution [the engineer in public health work], for health work no longer stands on the basis of medicine alone. Light, ventilation and humidity come into the problem of health; construction is most important, and in these matters the value of the engineer is obvious. Health administration never can be independent of medical skill and practice—medicine and engineering must go hand in hand.—*American Journal of Public Health.*

Medicolegal

Circumstances Obligating Corporation to Pay Physician

(Roff Oil & Cotton Co. vs. King (Okla.), 148 Pac. R. 90)

The Supreme Court of Oklahoma affirms a judgment for $200 in favor of plaintiff King, who sued the defendant company for $301 for medical services rendered to one of its employees, who was injured in its service. The court recognizes that, as a general rule, a corporation is not required to furnish medical attention to an employee injured while engaged in its service, and, nothing else appearing, an agent cannot bind the employer, unless it appears that such authority is within the scope of his agency. But the court holds that where an agent, in charge of the business of the employer, although of limited authority, does employ a physician for an injured employee, and the employer is notified within a reasonable time by the agent that such physician is in charge of the case, and makes no objection, and it further appears that the agent purchased medicine for the injured man, which was paid for by the employer, this is evidence to go to the jury of the notification of the employment. And such was practically the evidence in this case, where the jury returned a verdict in favor of the plaintiff for $200. The court says that the case was distinguishable from one in which there was no evidence whatever that the company sued had any knowledge that the physician was performing the services prior to the time of their completion. Furthermore, while it is true that the fact of agency cannot be proved by the hearsay declarations of the agent, yet the agent himself, while on the stand, may testify as to his agency and as to the scope of his employment. The payment of the drug bills was some evidence to be considered by the jury as to the liability which the defendant had assumed in regard to the injured man. The fact that the agent who employed the plaintiff also bought the medicine for him was, too, some evidence to go to the jury in establishing the agency.

Unlawful Practice of Medicine Under a Trade Name

(People ex rel. Lederman vs. Warden of City Prison (N. Y.), 152 N. Y. Supp. 977)

The Supreme Court of New York, Appellate Division, First Department, affirms an order dismissing a writ of habeas corpus obtained by the relator, who was held under a charge of practicing medicine unlawfully. This the court does on the opinion rendered below. That says that the relator transacted business under the duly adopted trade name "The Standard Pharmacy Co." The testimony was that a lady called at the office of this "company," inquired whether the doctor was in, and on receiving an affirmative answer, was referred to him. He is a duly licensed physician. He examined her, gave her a prescription, refused to receive any compensation, she had the prescription filled at the desk and paid therefor, and was again told that no charge would be made for the medical service. In addition to this evidence the record contained copies of the inscriptions on signs around the relator's establishment, a booklet of advertisements, and a "card for free examination." The signs were perhaps fairly beyond the purview of the statute. They read as follows: (a) "Standard Pharmacy Co." (b) "Doctor's office. Examination of urine. Electrical treatment, X-ray examination and other modern scientific methods." (c) "Standard Pharmacy Co. Medical Office. Entrance through Drug Store." (d) "Manufacturers of Standard Remedies." (e) "Examination of urine in order to determine the nature of the disease, and also to show a complete and reliable cure by our consulting specialist, free to our patrons who are using our valuable, well-tried, reliable and guaranteed prescriptions. The celebrated Standard Remedies." These signs might be interpreted as indicating merely that the relator was engaged in the manufacture of certain remedies; that he employed a physician, to whom patrons of his establishment might go for free medical advice, although the phrase "Standard Pharmacy Co. Medical Office" was rather suggestive. It might, however, be claimed that a "medical office" imported no more than a place where remedies might be obtained. The same might be said of the contents of the booklet. One page contained, among other things, the statement: "Coupon. Free medical advice to patrons. . . . Consultation, examination, and advice free by the consulting specialist of the Standard Pharmacy Co." This might be regarded as unobjectionable, but the same cannot be said so clearly of the further recital: "The medical office of the Standard Pharmacy Co. is fitted up in the most complete manner with all the latest scientific medical and surgical apparatuses." Without reviewing further extracts from this booklet, it might be said, however, that the doubts entertained as to the legal propriety of the advertisements might properly be resolved in the plaintiff's favor, were it not for the card for free examination above referred to. This read as follows: "Card for free examination. Medical and surgical office of the Standard Pharmacy Co., 321-323 Bowery, corner 2d street, New York,.....191.. To the Doctor: Please make examination and give medical advice to bearer, who is now using , and charge same to Standard Pharmacy Co. Per Make no charge to holder of card." On the reverse side: "Office hours —Daily, 12:30 to 2; evenings, 5 to 6:30 and 8 to 9; Sundays, 12 to 2." This card is regarded as other than an announcement that the Standard Pharmacy Company maintained a medical and surgical office, in charge of its doctor, who gave its patrons examination and medical advice on its behalf. It is deemed that the relator held himself out under his trade name as being able to diagnose and treat diseases and offered and undertook to do so. Subdivision 7 of section 160 of the Public Health Law defines the practice of medicine and indicates in substance that it consists in holding one's self out as being able to diagnose or treat human diseases, and offering or undertaking such treatment. This factor of holding out apparently underlies all the important cases in which the defendant has been held for violation of the law.

Privileged Communications

(Kansas City Southern Railway Co. vs. Miller (Ark.), 175 S. W. R. 1164)

The Supreme Court of Arkansas, in affirming a judgment in favor of plaintiff Miller for damages for injury to his eyes alleged to have been caused by escaping steam, holds that the testimony of certain physicians was properly excluded. It was urged that the plaintiff by bringing suit for the injury and becoming a witness and detailing the facts, the treatment thereof, and the condition resulting from it, thereby waived the privilege granted to him by the statute. The court answers that, while there is much reason for holding that the privilege is waived under such conditions, and that in the interest of justice the truth of the matter should be discovered by the testimony of the physicians, the patient having disclosed and detailed the facts of the injury minutely and the treatment thereof, this court has taken the other view and held that the privilege is not thereby waived. Neither does the court agree with the contention that a physician's testimony was admissible for the reason that he did not in fact make the examination he made and ascertain the condition of the plaintiff's eyes in the capacity of his physician, not having in fact been employed by nor treated him, when, however, it was undisputed that the plaintiff went to the physician and consulted him about his injury and permitted the examination to be made with a view to engaging his professional services, and that the information was necessary to enable him to prescribe as a physician, and acquired for that purpose. The fact that the plaintiff after the examination discovered that the physician was employed by the defendant company to treat its injured employees, and declined to engage him to treat his injuries, would not permit the physician to disclose the information so acquired over the patient's objection.

The Child-Mind.—Nor does it help much to divide them into the feebleminded and the normal, or the wayward and the normal, for "the normal" . . . does not, strictly speaking, correspond with anything found in nature.—Charles B. Davenport, Educational Hygiene, *Scribner*, 1915.

Society Proceedings

COMING MEETINGS

American Association of Railway Surgeons, Chicago, Oct. 13-15.
Am. Assn. for Study and Prevention of Inf. Mortality, Phila., Nov. 10-12.
Colorado State Medical Society, Denver, Oct. 5-9.
Delaware State Medical Society, Wilmington, Oct. 11-12.
Medical Association of the Southwest, Oklahoma City, Oct. 12-13.
Mississippi Valley Medical Association, Lexington, Ky., Oct. 19-21.
National Assn. for the Study of Pellagra, Columbia, S. C., Oct. 21-22.
Southern Medical Association, Dallas, Tex., Nov. 8-11.
Vermont State Medical Society, Burlington, Oct. 14-15.
Virginia State Medical Society, Richmond, Oct. 26-28.

MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA

Sixty-Fifth Annual Meeting, held in Philadelphia, Sept. 20-25, 1915

The President, DR. EDWARD B. HECKEL, Pittsburgh, in the Chair

Civic Responsibility of the Physician and the Medical Society

DR. JOHN B. MCALISTER, Harrisburg: Some of the most vital problems for thought are: (1) Standardization of the profession throughout the country. May we live to see the day when a licensed doctor in Oklahoma is a licensed doctor in Pennsylvania. (2) Medical legislation in Pennsylvania. Our legislative committee needs our wisest judgment and conscientious cooperation. The establishment of a board of regents similar to the New York Board of Regents would solve the problem of the constant struggle to protect our own standards, protect the public against fraud and incompetency, relieve us of the reproach of bigotry and selfishness and prevent the multiplicity of examining boards. (3) Preventive medicine calls loudly for a National Health Department in the Federal Government. (4) Cancer and tuberculosis which are preventable at some stage. (5) The doctor and the newspaper. The newspaper is more powerful than all the guns of all the armies in the world. The doctor and the press should join forces for the public good. The press is of inestimable service in educating the public in health, hygiene and preventive medicine, and in influencing legislatures.

Report of the Subcommittee on Cancer for 1915

DR. JONATHAN M. WAINWRIGHT: This society was the first organization in this country to make any systematic effort to attack this problem. Our first effort was to induce every medical college professor interested in a subject approaching cancer to impress on his students the fundamental points of the cancer campaign. We hope to induce our examining boards to insist on a proper knowledge of cancer. We have tried to induce every nurse's training school in the state to have their nurses properly instructed regarding the disease. Perhaps the most efficient plan by which the society has worked has been through our county societies. In June thirty-eight counties held meetings devoted to this subject. We believe that much the most important and efficient single effort ever made in this country and perhaps abroad in the attack on cancer has been the effort to have our medical journals devote a major part of their July issue to the cancer campaign. Sixty-five journals responded. The American Society for the Control of Cancer is cooperating with our society.

Scopolamin-Morphin Anesthesia in Obstetrics

DR. JAMES R. FREELAND, Pittsburgh: The literature appearing in association with this subject in the last fifteen months is to be classed largely as advertising matter. Scopolamin should be considered simply as a useful sedative in selected cases. This attitude is probably responsible for our good results. Complete amnesia should not be regarded as the main object. The attitude of the physician toward patients demanding "twilight sleep" should be that of reserving the right to choose the anesthetic just as the surgeon does. The demand for painless labor denotes an unhealthy mental attitude.

DISCUSSION

DR. BARTON COOKE HIRST, Philadelphia: In a series of cases I find the disadvantages of this method to be—if there is given enough scopolamin and morphia to produce indifference to pain—prolongation of labor, tendency to atony of the uterus with hemorrhage and an increased proportion of apneic babies that cannot be revived. If one tries to escape these disadvantages by following the latest methods of giving minimum doses of the two drugs, the disadvantages disappear but the relief afforded is scarcely noticeable, in my experience. However, the advantages of this method are not to be ignored, and I have found it useful in primiparas of a neurotic type, apt to have a long painful labor. Here I use it not to relieve pain so much as for psychologic effect, which we cannot afford to ignore. I employ all the accessories, the darkened room and the banishment of everyone but a trained nurse and the doctor. It is not fair to take a negative stand in the criticism of any method unless some alternative is proposed. We should earnestly endeavor to preach a proper solution of this subject. I am at present making some experiments with cannabis indica as a drug which may relieve the pains of childbirth without disadvantage to mother or child.

DR. DANIEL LONGAKER, Philadelphia: The full benefit of scopolamin is obtained only when we secure complete amnesia. Every woman should be transferred to the specially appointed hospital for her confinement, regardless of the method of delivery. I agree with Dr. Freeland that the apnea is due to the morphia. There are certain cases in which neither scopolamin nor morphin should be used.

DR. JAMES R. FREELAND: I am sorry I cannot join the enthusiasts for the use of scopolamin. My first objection is the name, "twilight sleep." It is a trade name, and has no place in the practice of medicine. The matter of suggestion is harmful to the patients and a certain proportion will come later into the hands of the neurologist.

Some Criteria Underlying Prognosis in Certain Forms of Cardiac Insufficiency

DR. JAMES E. TALLEY: The average patient of middle life with symptoms suggesting beginning cardiac insufficiency will probably have either (1) primary chronic endocardial or myocardial disease, usually rheumatic; (2) primary endocardial or myocardial disease with secondary nephritis; (3) primary renal disease with a secondary myocardial and vascular disease; (4) primary arterial or arteriocapillary sclerosis with secondary cardiac and renal disease; (5) syphilitic cardiovascular disease. Omitting Groups 1 and 5 we have three groups of cardiorenal and cardiovascular disease, of special interest because of their frequency, association with pathologic elevation of blood pressure and because their study has tended away from the conception of renal disease being solely responsible for hypertension, and toward the renewal of the old conception of primary arteriolarcapillary fibrosis. Myocardial weakness as expressed by early dyspnea foretells a death by cardiac insufficiency for one half of such patients. Extreme dyspnea may be associated with pulmonary edema which is lethal in one or a few attacks. Anginoid pain forecasts that one third of the patients will succumb in an acute anginal attack; the remainder to cardiac failure. The underlying criteria in prognosis are the information derived from symptoms and objective signs. The symptoms are many and vary as the heart or renal element predominates. Periodic early morning headache means a uremic death for a large number; an apoplectic death for a somewhat less number. Nocturnal polyuria points to a uremic death. Hypertension accompanies all three groups. Although all three groups are doomed, the one with the vastly impaired elimination is doomed to a renal death and probably earlier than the other two. Dr. Paul D. White has shown pulsus alternans to be much more common than we have thought. In cardiac, vascular, and renal patients the mode of death is given and the expectancy of life is furnished by the same statistics. From the onset of the first symptoms one half will succumb during the first five years; one quarter between five and ten years, and one quarter will be living after ten years.

DISCUSSION

DR. JOSEPH SAILER, Philadelphia: The importance of the prognosis in cardiovascular disease is due largely to the fact that, although the conditions are incurable, much can be accomplished by therapeutic measures for the comfort of the patient and the prolongation of life. Differential diagnosis here is in degree rather than in the kind of the disease, and in this differential diagnosis of degree Dr. Talley has properly laid stress on blood pressure, colorimetric tests of the functional capacity of the kidneys and graphic methods of recording the heart action. These methods, however, are not absolute. The increase or decrease in the functional capacity of the kidneys, the rise or fall of arterial tension and possibly the modification of the heart tracing are more significant of the probable course of the case than any single observation.

DR. H. B. ALLYN, Philadelphia: The cause of the disease has much to do with the prognosis. Lesions resulting from an acute infection often remain quiescent for many years and the patient is not much worse. I have seen within a few days a patient who was left with aortic insufficiency from scarlet fever when 3 years old and who is now approaching 50. Her heart has needed little attention for fifteen years. On the other hand, when the lesion is a myocardial degeneration, the prognosis is much worse. Dyspnea, its degree and the readiness with which it is induced, is often of more value in prognosis than any physical sign.

DR. H. A. HARE, Philadelphia: The more experience one has with cases of cardiovascular disease the more cautious is he in prognosis. While pulsus alternans is of grave import it is not unusual to see a patient with this symptom live several years. In reaching a prognosis in cardiac disease we must study the patient as a whole and not be content with examinations of the heart, even if these examinations are made with instruments of precision.

The Heart of the Athlete; Its Prospect and Protection

DR. ROBERT N. WILLSON, Philadelphia: Two vital questions immediately involved in a study of the wisdom or physical unprofitableness of college and schoolboy competitive athletics are: (1) the ultimate (postgraduation) result of public competitive athletics on the physical health and lives of the participants; (2) the possibility of determining the genuine physical integrity of the proposed participant or his lack of the same, especially with respect to his heart. In recent years there have been many deaths among former athletes. I know of not one instance of recovery from a major infectious disease in an athlete, except in the typhoid epidemic at Easton. Here a number of undergraduates, presumably not yet shorn of their resisting forces, made a successful fight and recovered. We must remember that the normal heart will not tolerate repeated insults sustained in the strain of training and final competition without the loss of recuperative power. Latent athletic injuries would seem to explain the tendency of the strong and robust to die, while the less powerful win out against infectious disease. A still more radical evil is the encouragement offered by college and university to the schoolboy to emulate his college brother in competitive athletics. I stop short of advising against active competition as the Germans have. I am simply pointing to sign boards written in bold letters. Trainers should be taught just what the collapse of today means in the future of the athlete. Some day the college authorities must of necessity conclude that no form of athletic event is sane that demands of the participants the semiconscious state of heart exhaustion at its conclusion.

DISCUSSION

DR. N. A. STAUFFER: I believe in competitive sports for the same reason that I favor competition in other professions. All of the University of Pennsylvania football team are in excellent health, and records of athletes compiled by other observers do not bear out the statement that competitive sports are harmful, except to the unprepared.

DR. ALBERT E. ROUSSEL: Physicians should appreciate the value of graduated exercise throughout life, but exercise should be under supervision in selected cases.

DR. R. N. WILLSON: I am not opposed to competitive athletics if they can be rendered sane. The point raised is, what will the athlete's heart do in the presence of systemic, especially infectious, disease? I believe it is time to safeguard the hearts and vessels and lives of our boys.

Chronic Arthritis

DR. THOMAS MCCRAE: The etiologic factor in the great majority of cases of chronic arthritis is infection somewhere, and a knowledge of the cause is an important element in treatment. As the process is often progressive, it is the more essential to recognize this and endeavor to remove the cause before serious damage is done. This involves a thorough search for the possible source of infection and proper treatment if found. The effort to apply this etiologic therapy should be distinguished from measures which are merely symptomatic or those directed to improve the condition of joints already damaged.

DISCUSSION

DR. A. P. HIRSH: The terms "rheumatoid arthritis" and "chronic rheumatism" should be named only to be discarded. A tentative nosology is now possible for chronic arthritic disease being based on the researches of Dr. McCrae and others in this field. Three factors involved in the definite treatment method of one group of joint infections wrongly classed "deforming arthritis" are: (1) removal of the original source of infection; (2) persistent local applications over each affected joint until all possible removable deposit is gone; (3) a systematic effort to correct the patient's general metabolism. Removal of the causative infection implies an exhaustive differential diagnosis. It is to the local treatment methods that attention is especially directed, the most efficient of which is the high pressure, small volume and low frequency static wave current sent through 22-gage flexible metal plates closely fitting the involved joints. The static indirect sparks are also applied between these joints. Of the several modalities no single one will suffice but their intelligent combination will bring success in the treatment of that opprobrium of our calling, deforming arthritis.

The Tertiary Manifestations of Syphilis as Seen in a General Medical Ward

DR. JOHN H. MUSSER, JR.: The study is based on the results of the Wassermann test on every case of chronic disease coming into the men's medical service at the Presbyterian Hospital in the last four months, excluding the frank pneumonia and typhoid fever cases, and necessarily those dying, or leaving the ward before there was time for the test. It was found that one fifth of patients with chronic disease had syphilis. The following conclusions may be drawn: 1. A large percentage of cases of chronic disease is dependent on a syphilitic infection. 2. It is impossible always to detect such cases of syphilitic infection without a Wassermann reaction. 3. Owing to the importance of diagnosing such cases which show syphilitic infection, a Wassermann test of the blood serum should be made in every case of chronic disease admitted to a general medical ward.

DR. JOSEPH SAILER: That many forms of chronic disease are dependent on a syphilitic infection which does not manifest itself in the usual way is the experience of all of us. Of two such patients both physicians, one suffered merely from malnutrition and indefinite digestive disturbance for which there was no adequate explanation. The Wassermann was positive. Two weeks after the first injection of salvarsan he gained ten pounds and has since remained well. The other physician suffered merely from an irritative dry cough of the most persistent character. He was the father of three healthy children. There were none of the ordinary manifestations of syphilis. A positive Wassermann suggested the use of salvarsan and the cough stopped almost immediately after the first intravenous injection. Assuming that only 10 per cent. of the population suffers from syphilis, which, based on our laboratory reports is a modest number, at least 9,000,000 people suffer from it in the United States. It is fair to conclude that in the majority the manifestations are so obscure that there is no suspicion of its existence.

(*To be continued*)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Anatomy, Philadelphia

September, XVIII, No. 2, pp. 145-327

1 Development of Venous Sinuses of Dura Mater in Human Embryo. G. L. Streeter, Washington, D. C.
2 Origin of Renal Artery in Mammals and Its Anomalies. J. L. Bremer, Boston.
3 Some Characteristics of External Ear of American Whites, American Indians, American Negroes, Alaskan Esquimos and Filipinos. R. B. Bean, New Orleans.
4 *Origin of Blood and Vascular Endothelium in Embryos without Circulation of Blood and in Normal Embryo. C. R. Stockard, New York.

4. **Origin of Blood and Endothelium.**—According to Stockard in most embryos the earliest blood cell formation occurs in the yolk-sac blood islands. The cells in these islands continue to divide until they become surrounded by endothelium, then the yolk-sac blood islands lose their hematopoietic function and become a vascular net through which the blood circulates. The liver now takes up the rôle of harboring dividing blood cells within its tissue spaces, when these spaces become vascularized by endothelium; here again the blood cells no longer multiply but merely circulate. Finally, in the mammalian embryo, one organ after another ceases to offer the necessary harbor for dividing blood cells, until the red bone marrow is the only tissue presenting the proper relationship of spaces and vessels, and here alone the erythropoietic function exists to supply the red blood cells for the entire body circulation. The red blood corpuscles are always produced so as to be delivered into the vessels and thus soon occupy an intravascular position, while the white blood cells arise and remain for some time among the mesenchymal tissue cells in an extravascular position. Lymphocytes and leukocytes along with the invertebrate amebocytes are all generalized, more or less primitive, wandering cells and are almost universally distributed throughout the metazoa.

Erythrocytes are highly specialized cells with a peculiar oxygen carrying function due to their hemoglobin content. In contrast to the universal distribution of the leukocytes the erythrocytes are only found in the vertebrate phylum, except for a few cases existing in some of the higher invertebrate groups. Yet even in these particular cases the oxygen-carrying blood cell never presents the typically uniform appearance of the vertebrate erythrocyte. The facts presented seem to indicate that vascular endothelium, erythrocytes and leukocytes, although all arise from mesenchyme, are really polyphyletic in origin; that is, each has a different mesenchymal anlage. To make the meaning absolutely clear, Stockard considers the origin of the liver and pancreas cells as parallel, as both arise from the endoderm but each is formed by a distinctly different endodermal anlage, and if one of these two anlagen is destroyed the other is powerless to replace its product.

American Journal of Medical Sciences, Philadelphia

October, CL, No. 4, pp. 469-624

5 *Gastro-Enterostomy; Study of One Hundred Cases as Compared with Similar Number of Cases of Pyloroplasty. J. M. T. Finney and J. Friedenwald, Baltimore.
6 *Prolonged Fasting in Diabetes. F. M. Allen, New York.
7 *Present-Day (Allen) Treatment and Prognosis in Diabetes. E. P. Joslin, Boston.
8 Relative Pulmonary Insufficiency (Graham Steel Murmur). J. Sailer, Philadelphia.
9 Soy Bean and Condensed Milk in Infant Feeding. J. Ruhrah, Baltimore.
10 *Study of Splenic Enlargement in Early Syphilis. U. J. Wile and J. A. Elliott, Ann Arbor, Mich.
11 Chronic Lead Poisoning in Guinea-Pig; with Special Reference to Nephritis, Cirrhosis and Polyserositis. W. Ophuls, San Francisco.
12 *Appendicitis as Sequela of Tonsillitis; Report of Cases. H. B. Anderson, Toronto.
13 Case of Ligation of Portal Vein in Suppurative Portal Phlebitis. E. Beer, New York.
14 Report of Three Cases Resembling Pseudosclerosis and Progressive Lenticular Degeneration. W. B. Cadwalader, Philadelphia.
15 Value of Rectal Feeding. H. Adler, Baltimore.
16 Intracranial Telangiectasis; Symptomatology and Treatment; Report of Two Cases. E. Sachs, Washington, D. C.
17 *Respiratory Signs and Symptoms in Trichinosis. G. R. Minot and F. M. Rackemann, New York.
18 *Test of Myocardial Efficiency, with Review of One Hundred and Twenty-Seven Cases. H. Schoonmaker, Clifton Springs, N. Y.

5. **Gastro-Enterostomy.**—The largest proportion of cases in the series studied by Finney and Friedenwald in which gastro-enterostomy was performed occurred between the thirtieth and sixtieth years, while the largest proportion of cases in which pyloroplasty was performed occurred between the thirty-fifth and fiftieth years. The duration of the symptoms in the gastro-enterostomy cases varied from one month to nineteen years, while the duration of symptoms in the pyloroplasty cases varied between one and one-half months to twenty-five years. In the gastro-enterostomy cases the symptoms appeared in the following proportions; pain in 90 per cent.; vomiting in 65 per cent.; hematemesis in 23 per cent.; melena in 44 per cent.; retention in 36 per cent.; while in the pyloroplasty cases pain was present in 92 per cent. of cases; vomiting in 64 per cent.; hematemesis in 21 per cent.; melena in 46 per cent.; retention in 42 per cent. In the gastro-enterostomy series the ulcer cases are arranged as follows: There are 46 cases of gastric ulcer, 38 duodenal ulcers. In the pyloroplasty cases there were 55 cases of gastric ulcer and 32 duodenal ulcers. In 67 of the gastro-enterostomy patients operated on for obstruction 44 were due to gastric ulcer, 14 to duodenal ulcer, and 9 to adhesions, while pyloroplasty was performed for obstruction in 64 instances; for gastric ulcer in 51, for duodenal ulcer in 7, and in 6 for adhesions.

In the gastro-enterostomy cases secondary operations were performed in four instances to correct immediate difficulties, while in the pyloroplasty cases secondary operations were required in the same number of instances for a similar purpose. After gastro-enterostomy satisfactory results were secured in 82 per cent. of cases, and unsatisfactory in 18 per cent., while pyloroplasty was immediately successful in 90 per cent. of cases and unsatisfactory in 10 per cent. There were seven deaths, following immediately on the operation of gastro-enterostomy, while but five deaths followed pyloroplasty. Of the seventy-seven cases of gastro-enterostomy followed during the first year of the operation the results were satisfactory in 84.4 per cent. and unsatisfactory in 15.6 per cent., while of the eighty-two cases of pyloroplasty the results were entirely satisfactory in 93.9 per cent., and unsatisfactory in 6.1 per cent. Of the gastro-enterostomy cases, numbering seventy-four, followed after the first year of operation, the results were satisfactory in 84.2 per cent., and unsatisfactory in 15.8 per cent., while of the pyloroplasty cases, numbering seventy-eight, the results were satisfactory in 93.6 per cent., and unsatisfactory in 6.4 per cent. The end results in the gastro-enterostomy cases showed a percentage of 77.2 per cent. of satisfactory recoveries, while the pyloroplasty cases showed a percentage of 88.6 per cent. It is quite evident from this study that the immediate as well as the final results are clearly in favor of pyloroplasty. The only indications in favor of gastro-enterostomy are, in those instances in which there is an inability to mobilize the duodenum when adhesions are too dense, and in those cases in which there is a thickening and infiltration about the pylorus due to hypertrophic ulceration, conditions, however, which in their experience occur but rarely.

6. Abstracted in THE JOURNAL, July 3, 1915, p. 150.

7. **Treatment of Diabetes.**—The method which has been employed by Joslin in the treatment of these cases has been similar to that recommended and described by Allen. The more closely his directions have been followed the better the patients have done. No patient has required more that five days to become sugar-free. Many patients became sugar-free after the omission of three or four meals. Patients are put to bed and the plan of treatment is carefully explained to them. They are furnished with notebooks in which answers to their questions are recorded, taught the use of a diet card and how to examine the urine for sugar with Benedict's solution. So far, no patient whom Joslin has taught to test his own urine during the last year has died. He is coming to feel that coma no longer represents the culmination of the disease, but that it is an avoidable accident.

10. **Splenic Enlargement in Syphilis.**—One hundred cases of early syphilis were studied by Wile and Elliott. Of these nine cases were primary syphilis alone, the remaining ninety-one were cases in the first months of the infection, for the most part with cutaneous or mucous membrane involvement. Of the 100 cases examined, definite splenic enlargement was found in thirty-six. The spleen was noted as being hard and firm in seventeen cases, in six it was noted as tender, and in three as soft. Of the thirty-six positive cases the general health was definitely affected in twenty-seven and the remaining nine showed no impairment of the general functions. Severe involvement of the general health was found in four cases. This entailed in one case a loss of 50 pounds in weight. Expressed in terms of percentage, 78 per cent. of those cases in which the spleen was enlarged were cases in which the general health suffered considerable deterioration. On the other hand, it must be noted that the general health was affected in 22 per cent. of the cases in which enlargement of the spleen was not present. Definite involvement of bone, including under this heading ostalgia, arthralgia, periostitis, and arthritis, was found in fifteen of the thirty-six cases, or in 41 per cent.

Of the twenty-five cases in which both the neurologic examination and the spinal fluid was studied, nineteen showed definite involvement of the nervous system. Nineteen occurred coincident with a papular efflorescence; sixteen cases of the thirty-six had associated mucous membrane findings, four had alopecia. In two out of the nine primary cases the spleen was definitely palpable; in both of these there was, as yet, no general adenitis, nor was there any sign of hematogenous infection. In twenty-seven cases in which counts were made fourteen showed a leukocytosis of over 10,000, and of forty cases in which blood examinations were made and in which no splenic tumors are demonstrable, sixteen had a leukocytosis of over 10,000. With regard to the type of the splenic enlargement, by far the largest number were firm and readily palpable. The average enlargement extended about two finger breadths below the costal margin. The softer spleens, of which there were nineteen in the series, presented fully rounded margins, and were distinctly of the type that one encounters in typhoid and other acute infections. The incidence of pain and tenderness on pressure were noted in six cases, in one, at least, pain was noted as exquisite. In this case, however, although the enlargement persisted for a considerable time, the pain was promptly relieved by the antisyphilitic treatment.

12. **Appendicitis as Sequela of Tonsillitis.**—The following points are emphasized by Anderson. The importance of bearing in mind the liability of appendicitis to follow acute tonsillitis. That the appendicular involvement may be only part of generalized infection, hence the gravity of such cases is out of proportion to the local symptoms. The tendency for such cases to be atypical in their clinical course, and after smouldering, to suddenly develop fulminating symptoms. Chronic tonsillar infections should be kept in view as the possible cause of similar infections of the appendix. That whereas at least some degree of local tenderness and rigidity are almost always to be elicited on careful examination of the abdomen in the right iliac region in acute appendicitis, in rare cases these signs may be absent.

17. **Respiratory Signs in Trichinosis.**—One hundred and two cases of trichinosis are reviewed by Minot and Rackemann. The diagnosis in 70 per cent. of these cases was made by finding the embryo in excised pieces of muscle or in the blood; in 5 per cent. no parasite was found, but the muscle showed a histologic picture of a myositis such as is found when trichinae are present; in 25 per cent. by the history, symptoms, and physical signs, and the eosinophilia which varied from 13 to 63 per cent. of the total leukocyte count. All of the 102 patients recovered except one and it should be noted that although this patient had moderate dyspnea, no abnormal physical signs in the lungs were detected. In 50 per cent. of the 102 cases studied there is no mention of cough or abnormal lung signs at any time during the course of the disease, but in the remaining 50 per cent., sixteen patients (15.6 per cent.) had cough without abnormal physical signs in the lungs, while seventeen (16.6 per cent.) had cough with abnormal lung signs, making thirty-three patients (32.3 per cent.) that had cough beginning from one to twelve days (usually two to six) after the onset of the disease and lasting three to twenty-five days or thoughout the course of the illness; eighteen patients (17.6 per cent.) had abnormal signs in the lungs without cough, making thirty-five patients (34.5 per cent.) that had abnormal physical signs in the lungs. These physical signs were present within forty-eight hours after the patient entered the hospital in thirty-two cases (31.5 per cent.), and in three cases (2.9 per cent.) within six days. The duration of these signs seemed to depend on the length of time the temperature remained elevated, the signs disappearing as the temperature fell. If the signs were slight they existed as a rule, but for a few days, and only at the height of the fever. Nine cases (8.8 per cent.) showed respiratory signs or symptoms, or both, severe enough to lead to a serious consideration or actual diagnosis of a purely pulmonary condition during the first few days the patients were in the hospital.

18. **Myocardial Efficiency.**—In the estimation of myocardial efficiency, Schoonmaker says, systolic blood pressure and pulse pressure variations together with changes in pulse rate in relation to postures and light exercise have positive value. Under the test described, an increase in systolic pressure together with a stationary or increased pulse pressure is suggestive of fairly good myocardial efficiency. A decrease in systolic pressure together with a decrease in pulse pressure is suggestive of poor to bad myocardial efficiency. In these determinations Schoonmaker takes the pulse, systolic blood pressure and diastolic blood pressure with the patient reclining and fully relaxed; then he has him walk at his ordinary speed about 75 feet and repeat the test in the standing position. This exertion is not sufficient to cause such subjective symptoms as dyspnea, palpitation, or chest pain unless the heart muscle be much impaired. It should not do this. It is a postural test plus only sufficient exertion to mildly stimulate the cardiovascular system.

American Journal of Roentgenology, Detroit

May, II, No. 7, pp. 749-792

19 Roentgen Signs of Gastrojejunal Ulcer — Some Suggestion as to Technic of Examination; Report of Two Cases. R. D. Carman, Rochester, Minn.
20 Monoosteitic Form of Paget's Disease of Bone. S. H. Hurwitz and G. L. Carr, Boston.
21 Massive Versus Fractional Dose in Roentgentherapy. A. M. Cole, Indianapolis.
22 Pulmonary Roentgenology. A. W. Crane, Kalamazoo.
23 Simple Contrivance for Reducing Pott's Fractures or Any Lateral Dislocation of Ankle Joint. A. McLean, Detroit.
24 Improvement in Technic of Gallbladder Diagnosis. G. E. Pfahler, Philadelphia.
25 Demonstration of Salivary Calculi. P. M. Hickey, Detroit.

Arkansas Medical Society Journal, Little Rock

September, XII, No. 4, pp. 91-113

26 Adiposis Dolorosa. C. H. Cargile, Bentonville.
27 Endotoxin Reaction. E. H. Martin, Hot Springs.
28 Old Man and His Prostate. J. P. Runyan, Little Rock.
29 Successful Removal of Nail from Right Bronchus of Sixteen-Month-Old Baby. R. H. T. Mann, Texarkana.
30 Measles and Its Complications; Report of Cases. E. H. Hunt, Clarksville.

Boston Medical and Surgical Journal

September 23, CLXXIII, No. 13, pp. 451-488

31 Localizing Needle Fragments in Tissues of Body by Means of Magnetism. G. H. Monks, Boston.
32 *Acute Perforation of Ulcers of Stomach and Duodenum. I. J. Walker, Boston.
33 Traumatic Rupture of Duodenum and Duodenal Fistula; Report of Case. D. Cheever, Boston.
34 Cholelithiasis. Argument for Early Operation. J. C. Hubbard, Boston.
35 Acute Pancreatitis; Case Reports. C. E. Durant, Haverhill.
36 Proper Classification of Borderline Mental Cases among Offenders. V. V. Anderson, Boston.
37 *Relation between Genetic Factors and Age of Onset in One Hundred and Fifty-Seven Cases of Hereditary Epilepsy. D. A. Thom, Palmer.
38 Case of Epidemic Typhus Imported into Central New York. I. H. Levy and J. L. Kantor, Syracuse.
39 Blood Pressure. C. Phipps, Boston.

32. **Perforation of Ulcers of Stomach and Duodenum.**—The cases on which Walker's paper is based were gathered

from the surgical records of the Boston City Hospital for the years 1905 to 1914, inclusive. The series covers seventy-eight cases, operated on by seventeen surgeons. The technic was, in general similar, and the operative results practically the same. Males were found to have been affected more frequently than females, in the proportion of 12 to 1. A definite alcoholic history was given in 66.6 per cent. Of those who succumbed 78 per cent. used alcohol in more than moderation. The site of the perforation was found to have been in the stomach in forty-two cases, and in the duodenum in thirty-six cases. The perforations of the stomach were invariably located within 1½ inches of the pylorus. In all except two, the site was on the anterior wall, and generally nearer the lesser curvature. The perforations of the duodenum were all found on the anterior wall except one.

In this series the peritoneal cavity was generally irrigated in twenty cases, with nine deaths and eleven recoveries. All the cases irrigated showed a peritonitis more or less marked. Of those cases showing peritonitis, which were not irrigated, there were nine, with five deaths. In twenty-nine cases in this series, cultures were taken from the fluid in the peritoneal cavity. Of these, fourteen showed bacterial growth, and fifteen were negative. Peritonitis was the cause of death in fourteen of the twenty-one cases. Occasionally it resulted in a localized abscess in the pelvis, right lower quadrant, or subphrenic region. Postoperative hemorrhage and shock were the cause of death in three instances. Pneumonia occurred six times, with four deaths. The other complications recorded were pleurisy with effusion, and abscess of the lung with recovery in each case. In this series of cases, there were fifty-seven recoveries and twenty-one deaths, a mortality of 26.9 per cent. Of those who recovered the average duration of the perforation was fourteen and one-half hours, and of those who died thirty-seven and one-third hours. Seventeen were operated on during the first four hours and all recovered. Of those operated on from five to twelve hours after perforation, the mortality was 17.9 per cent.; of those operated on from thirteen to twenty-four hours, 47.6 per cent.; and of those from twenty-five to forty-eight hours, 66.2 per cent. Ten were operated on after forty-eight hours, with five deaths and five recoveries. Of those who recovered each had a walled-off abscess, and not a generalized peritonitis, thus accounting for the recoveries.

37. **Hereditary Epilepsy.**—One hundred and fifty-seven cases were studied by Thom to determine the relation between the hereditary factor in the forebears and the age of onset of the epilepsy in the offspring. One hundred and twenty-six cases had direct heredity (that derived from parents or grandparents), and thirty-one cases had collateral heredity (that shown in members of the family other than parents or grandparents). There were 293 heredity defects in the 157 cases, occasionally one member of the family having more than one defect, and in other instances two or more relatives being defective. Ninety-six (61 per cent.) of the cases gave a family history of but one defect; forty-seven (30 per cent.) had two defects and the remaining fourteen cases (9 per cent.) had three or four defects. Epilepsy was met either alone or in combination eighty-eight times (57 per cent.), alcohol fifty-nine times (38 per cent.), insanity forty-three times (27 per cent.), migraine thirty-seven times (24 per cent.), and feeblemindedness sixteen times or 10 per cent. of the total number of cases. In 95 per cent. of the cases in which alcohol, migraine or feeblemindedness was the defective factor the heredity was direct, while only 56 per cent. of epilepsy and insanity came from the forebears. In seventy of the ninety-six cases, or 73 per cent., the heredity was direct, in the remaining twenty-six cases, collateral; in twenty-five of this latter group the mental defect was either epilepsy or alcohol.

Colorado Medicine, Denver

September, XII, No. 9, pp. 247-281

40 Tuberculin Treatment. J. F. McConnell, Colorado Springs.
41 Dietary Studies in Institutions for Tuberculous Patients in State of Colorado. C. D. Spivak, Denver.
42 Typical and Atypical Cases of Addison's Disease. G. H. Cattermole, Boulder.
43 Death from Hemorrhage Following Peritonsillar Abscess. T. E. Carmody and W. C. Finnoff, Denver.
44 Subperiosteal Abscess of Maxillary Sinus. A. R. Solenberger, Colorado Springs.
45 Pellagra Curable Disease. M. O. Shivers, Colorado Springs.
46 Refraction and Convergent Strabismus. W. H. Crisp, Denver.
47 Case of Rocky Mountain Spotted Fever. C. H. Farthing, Meeker.

Georgia Medical Association Journal, Augusta

September, V, No. 5, pp. 105-126

48 Syphilitic Disease of Nervous System. L. M. Gaines, Atlanta.
49 Intravenous Injection of Bichlorid of Mercury in Treatment of Syphilis. J. T. Stukes, Americus.
50 Diagnosis of Syphilis and Parasyphilis from Standpoint of Laboratory. A. H. Bunce, Atlanta.
51 Syphilis of Stomach and Intestines; Report of Cases. L. C. Fischer, Atlanta.
52 Venarsen. E. P. Merritt, Atlanta.

Journal of Biological Chemistry, Baltimore

September, XXII, No. 2, pp. 241-432

53 Protein Minima for Maintenance. T. B. Osborne and L. B. Mendel, New Haven, Conn.
54 Some Products of Hydrolysis of Gliadin, Lactalbumin and Protein of Rice Kernel. T. B. Osborne, D. D. Van Slyke, C. S. Leavenworth and M. Vinograd, New York.
55* Improvements in Method for Analysis of Proteins by Determination of Chemical Groups Characteristic of Different Amino-Acids. D. D. Van Slyke, New York.
56 Oxalic Acid Producing Penicillium (P. Oxalicum). J. N. Currie and C. Thom, Washington, D. C.
57 *Hexone Bases of Malignant Tumors. R. A. Kocher, San Francisco.
58 Colorimetric Method for Determination of Phenols (and Phenol Derivatives) in Urine. O. Folin and W. Denis, Boston.
59 Excretion of Free and Conjugated Phenols and Phenol Derivatives. O. Folin and W. Denis, Boston.
60 Selective Activity of Human Kidney. O. Folin and W. Denis, Boston.
61 Qualitative (Reduction) Test for Sugar in Normal Human Urine. O. Folin, Boston.
62 On *d*-Lyxohexosaminic Acid and On *a* a_1-Anhydromucic Acid. P. A. Levene and F. B. La Forge, New York.
63 Action of Aseptic Tissue on Glucosone. P. A. Levene and G. M. Meyer, New York.
64 Acidity of Undiluted Normal Gastric Juice from Case of Human Gastric Fistula. M. L. Menten, Chicago.
65 Spectroscopic Examination of Color Reactions of Certain Indol Derivatives and of Urine of Dogs after Their Administration. A. Homer, Toronto.
66 Method for Estimation of Tryptophan Content of Proteins, Involving Use of Baryta as Hydrolyzing Agent. A. Homer, Toronto.
67 Relation between Administration of Tryptophan to Dogs and Elimination of Kynurenic Acid in Their Urine. A. Homer, Toronto.
68 *Dextrose and Diastase Content of Blood as Affected by Ether Anesthesia of Animals Fed on Different Diets. E. L. Ross and H. McGuigan, Chicago.
69 Peptone Hypoglycemia. H. McGuigan and E. L. Ross, Chicago.
70 Kyrine Fraction Obtained on Partial Hydrolysis of Proteins. P. A. Levene and J. van der Scheer, New York.

57. **Hexone Bases of Malignant Tumors.**—In five cases of malignant tumor examined by Kocher the quantity of hexone bases was approximately double that found in normal tissue. He says that these results suggest a new approach to the study of the cancer problem, especially as it relates to metabolism. Whether such high percentages of the hexone bases is a peculiarity of malignant tumors, or whether such an increase will be found in normal rapidly growing tissue is a problem now under investigation by Kocher.

68. **Dextrose and Diastase Content of Blood.**—Ten dogs were fed on a mixed diet for a period of about a week. At the end of that time they were anesthetized for two hours. The dextrose and diastase contents of the blood were determined at intervals before and during the anesthesia. The animals were then fed on a meat diet for a similar period, and the sugar and dextrose determinations made as before, during and after ether anesthesia, in such a way that the concentration of each could be directly compared. The results indicate the following: Ether anesthesia causes a hyperglycemia, which is greater in dogs fed on a pure meat diet than on a diet including carbohydrate. Ether itself, and not asphyxia or excitement, is responsible for the greater part of the blood sugar change. Ether anesthesia does not increase the diastatic power of the blood serum. The diastase concentration of the blood is on the average higher in animals which have been fed on a meat diet than on a mixed diet.

Journal of Medical Research, Boston

September, XXXIII, No. 1, pp. 1-145

71 *Study of Experimental Diabetes in Canine and Its Relation to Human Diabetes. J. Homans, Boston.
72 *Study of Scharlach R Reaction and of Allied Forms of Epithelial Proliferation. F. D. Bullock and G. L. Rohdenburg, New York.
73 *Primary Melanosarcoma of Suprarenals. W. W. G. Maclachlan, Pittsburgh.
74 *Filterability of Trypanosomes. S. B. Wolbach, W. H. Chapman and H. W. Stevens, Boston.
75 Cholesterol Content of Cerebrospinal Fluid. P. G. Weston, Warren, Pa.
76 *Action of Benzol. Significance of Myeloid Metaplasia by Spleen. H. G. Weiskotten, S. C. Schwartz and H. S. Steensland, Syracuse, N. Y.
77 Blood Picture of Healthy Rhesus Monkeys. J. F. Anderson, and M. H. Neill, Washington, D. C.

71. **Experimental Diabetes in Canine.**—The progress of experimental diabetes in the canine, though extremely rapid in comparison with the chronic course of diabetes in man, Homans says, resembles it in many respects. The administration of carbohydrate food intensifies the waste of dextrose and hastens the progress of both diseases. In both, the body becomes emaciated by burning as many of its own tissues as are available. In both, there is a tendency to a fatal outcome. The life of a human diabetic, however, is lengthened if the individual is kept free, by dietary measures, from carbohydrate waste (glucosuria). A similar observation is suggested by the experimental observations of Homans, and has been actually demonstrated by Allen and applied by him with encouraging evidence of success in man. Homans believes, therefore, that experimental and human diabetes are, therefore, strikingly alike. The experimental disease is due to a functional deficiency on the part of the islands of Langerhans. Diabetes of man, in the author's opinion, has in all probability a similar immediate etiology.

72. **Study of Scharlach R Reaction.**—The experimental data obtained by Bullock and Rohdenburg lead them to draw the following conclusions: The Scharlach R reaction is a reparative process, acting under conditions of prolonged disturbance of mechanical equilibrium between epithelium and connective tissue, and dependent for its inception and continuation on irritation and cell death. The contact with epithelial cells of a chemical irritant of slow absorbability and relative mild toxicity is indispensable for the production of the reaction. The chemical owes its power of inducing epithelial proliferation, not to its solubility in lipoids, but to its ability to cause continuously a certain amount of tissue death. Cessation of epithelial proliferation occurs before the absorption of the foreign substance and indicates the return of equilibrium after the performance of the new task imposed on the tissues. The character and extent of the reaction are independent of the amount of blood circulating in the tissues. The degree of reaction depends on the surface area of epithelium exposed to the irritant. Scharlach R exerts no specific stimulating action on epithelial cells. The attraxine hypothesis of Fischer is untenable. Metaplasia is a frequent occurrence in the tissue of the ear, breast, prostate, and lung, after the injection of a chronic irritant of the type used in their experiments.

73. **Primary Melanosarcoma of Suprarenals.**—A case of primary melanosarcoma, arising in the suprarenal glands is reported by Maclachlan. The tumor was bilateral and almost symmetrical. A complete necropsy was performed and a most exhaustive search failed to demonstrate any primary neoplasm in the skin, choroid, or meninges. Scattered in the deep subcutaneous tissues of the trunk and upper extremity were many movable nodules. No mole could be found on the skin, nor did any of the tumor masses present at the surface. A pigmented tumor was found in each parietal bone, and innumerable nodules were present in the brain substance and pons and medulla. A single small nodule appeared in the falx cerebri but none were found in the leptomeninges. The eyes and optic nerves were carefully examined and found to be free from tumor. The accessory structures of the brain were normal. In the thorax a pigmented tumor was found in a mediastinal gland and a single small mass the size of a marble was present in the right lung. The heart showed the presence of multiple small pigmented tumors in the musculature of the right auricle and ventricle and in the left auricle.

Examination of the abdomen showed scattered nodules beneath the peritoneum of the abdominal wall, tissues of the mesentery, liver, bowel and other viscera. Three large masses of tumor were also found, one on each side directly above the kidney in the region of the suprarenals. Each of these masses was the size of an orange. The third mass was lying posteriorly in the midline near the cardia of the stomach and attached to the left lobe of the liver. This mass was as large as a grape fruit, and its anterior surface was adherent to the stomach along the lesser curvature. On its posterior surface the mass showed a tear in its capsule and the tumor tissue was also torn. From these parts the peritoneal bleeding had its origin. Elsewhere, the tumor, which was intensely black, was covered by a thin capsule. The great omentum contained a number of nodules the size of cherries. Many of the glands in the mesentery were invaded by black growths. Tumor masses were seen through the capsule of the liver. The gallbladder showed six small, pedunculated black tumor masses at the fundus. The bile ducts were clear. Several small encapsulated black masses about 1 cm. in diameter, were seen in the pancreas, and also in the loose connective tissue and lymph glands about the organ. A single nodule was present in the spleen.

Each kidney was of about the usual size and was surrounded by a thick layer of fat, in which were studded many small black tumors. There were no tumor masses in the kidney substance proper and both organs were normal in appearance. Over the upper pole of the left kidney and in the region of the suprarenal was a large and intensely black tumor mass, 10 by 8 by 4 cm. On section the tumor was more or less lobulated and its tissues were soft and friable. It was surrounded by a thin capsule and sharply separated from the kidney substance. No remains of suprarenal substance could be found. From the renal vein, a vessel passed over the face of the tumor and entered it at the apex. Over the right kidney, in the region of the right suprarenal, was another tumor 10 by 9 by 4 cm. This tumor mass was similar in every way to the other on the left side. The right suprarenal gland could not be recognized in the tumor mass. A black tumor mass the size of a walnut was seen projecting into the cavity from the wall of the bladder at the fundus. The genital organs, rectum, and anus were without change. Microscopically the tumor differed in no way from the usual melanosarcoma which arises in the skin or in the choroid.

74. **Filterability of Trypanosomes.**—The authors found that trypanosomes from cultures and from animal tissues are not filterable through bacteria-proof filters.

76. **Action of Benzol.**—Following the subcutaneous administration of equal parts of olive oil and benzol in rabbits, the authors found that there occurs a rapid decrease in the number of leukocytes in the peripheral circulation. Following this primary fall in the leukocyte curve there occurs a primary rise, which is, in each instance, followed by a secondary fall before a permanent rise to a normal level. The primary and secondary falls in the leukocyte curves are accompanied by a marked decrease in the percentage of polynuclear leukocytes, indicating that the polynuclear leukocytes are especially affected after the injections. Coincidentally with the primary fall in the leukocyte curve, there occurred, in two thirds of the cases, a moderate but definite fall in the erythrocyte curve. The erythrocyte curve appears to progress independently of the leukocyte curve after the primary fall, and in the majority of instances remains unaffected during the secondary fall in the leukocyte curve. This fall in the erythrocyte curve was usually followed by a rise. In rabbits in which the injections are begun two days and six months respectively after splenectomy, the leukocyte and erythrocyte curves are essentially the same as in the nonsplenectomized rabbits which receive like injections, and the duration of the periods of regeneration is essentially the same. The differential counts on the nonsplenectomized animals and those animals splenectomized two days and six

months previously, show no essential differences, and the blood-cell picture is otherwise the same.

The authors are of the opinion that these observations on the leukocyte and erythrocyte curves indicate that in the rabbit the spleen serves no essential function in the destruction of leukocytes and erythrocytes, following subcutaneous injections of the olive oil-benzol mixture, or in their subsequent regeneration. Any destructive or regenerative function that it has is quickly assumed by some other part of the body when the spleen is removed. "Myeloid metaplasia" of the spleen is of no great importance as a compensatory phenomenon, and regeneration, as represented by the blood count, takes place at least as quickly in the absence of the spleen.

Journal of Nervous and Mental Diseases, Lancaster, Pa.

September, XLII, No. 9, pp. 593-656

78 *Feebly Inhibited. Violent Temper and Its Inheritance. C. B. Davenport, Washington, D. C.

78. **Feebly Inhibited.**—A study was made by Davenport of 165 family histories of wayward girls in state institutions. The study of the data obtained lead the author to the following conclusions: The tendency to outbursts of temper—"tantrums" in adults—whether more or less periodic or irregular, and whether or not associated with epilepsy, hysteria, or mania, is inherited as a positive (dominant) trait, typically does not skip a generation and tends, ordinarily, to reappear, on the average, in half of the children of an affected parent. It would seem to follow from the data presented that epilepsy, hysteria, and mania are not the causes of the violent tempers, frequently accompanying them; the violent outbursts are in no clear sense the "equivalent" of these various psychoses. Rather, the violent outbursts of temper are due in all these associations to a factor that causes periodic disturbance (possibly, paralysis of the inhibitory mechanism?). This factor has the greatest effect when acting on a nervous system that is especially liable to show the other psychoses. In other words, "tantrums" are apt to be associated with these various neurotic conditions, while they have no necessary connection with them.

Kansas Medical Society Journal, Topeka

September, XV, No. 9, pp. 267-298

79 Diagnosis of Gastric Ulcer by Roentgen-Ray. R. D. Carman, Rochester, Minn.
80 Surgical Treatment of Chronic Ulcers of Stomach. E. H. Beckman, Rochester, Minn.
81 Treatment of Syphilogenous Diseases of Nervous System with Salvarsanized Serum. P. B. Matz, Leavenworth.
82 Acute Intestinal Obstruction. H. L. Charles, Atchison.
83 Progress in Infant Feeding. C. Stein, Glasco.

Lancet-Clinic, Cincinnati

September 4, CXIV, No. 10, pp. 201-220

84 Medical Inspection of Immigrants. J. H. Oakley, Washington, D. C.
85 Can Skin Diseases Be Driven into System by Local Treatment? M. Scholtz, Cincinnati.

Medical Record, New York

September 25, LXXXVIII, No. 13, pp. 509-550

86 An Adult with Status Thymicolymphaticus of Heterosexual Chromaffin Type. H. A. Houghton, Bayside, Long Island.
87 Idiopathic Hemorrhagic Multiple Sarcoma of the Skin (Kaposi). F. Wise, New York.
88 Amputation of Great Toe; Muscular Physiology of Lower Extremity. J. C. Schapps, Butte, Mont.
89 Single Stitch Appendectomy. W. F. Fowler, Rochester.
90 Neuritis, Modern American Disease. T. M. Anderson, England.
91 Treatment of Gallstone Disease. O. Lerch, New Orleans.
92 House Infection, Potent Source of Tuberculosis. I. W. Brewer, Geneva.
93 Hardening of Consumptives. H. B. Masten, Cimarron, N. M.

New York Medical Journal

September 25, CII, No. 13, pp. 641-688

94 Micro-Organismal Cardiovascular Toxins. R. N. Willson, Philadelphia.
95 Prostatic Calculus. F. Huber, New York.
96 High Blood Pressure; Treatment by Means of Muscular Relaxation. M. Grossman, New York.
97 *Improved Method for Repair of Lacerated Perineum. H. A. Bernstein, New York.
98 Two Way Stopcock for Intravenous and Intraspinal Injections and as Aspirating Syringe. J. Roby, Rochester.
99 Recent Progress in Ether Administration. W. O. Weiskotten, Utica.
100 Gallbladder Disease. M. G. Wohl, Omaha.
101 Erythremia; Report of Case. R. R. Mellon, Ann Arbor, Mich.
102 Blood Urea in Renal Conditions. A. J. Underhill, Baltimore.
103 Case of Cancrum Oris Treated with Neosalvarsan. A. G. De Sanctis, New York.
104 Harrison and Boylan Laws. M. Zagat, New York.

97. **Improved Method for Repair of Lacerated Perineum.**—Bernstein believes it to be a mistake in technic, to raise these flaps of mucous membrane and fascia from the center of the wound; as by so doing, the tear is deepened, the vagina is shortened, and the trauma is increased. The circulation already established is interfered with, the amount of blood and serum naturally thrown into the wound is multiplied, edema and sloughing are encouraged, infection is invited, and healing is retarded. He catches up the tissues at the entrance of the vagina, just below the lowest caruncle on either side, and separates the labia, making an incision along the crescentic border created between these points. Next, he says, separate slightly the edge of the mucous membrane from its underlying fascia. Then make an incision into the fascia, following the same line as the first one, and raise the fascia slightly from its bed. With artery clamp or suture, draw down the central point of the lower cut edge of the wound, which makes a central ridge, corresponding to the deepest part of the original tear. With blunt scissors or finger, make an opening on either side into the exposed connective tissue, leaving the center intact, and the strands of the levator muscle can easily be brought into view. Catch up the strands of the levator muscle on either side, bringing them out of the wound and together in front of the central ridge, with three or four chromic catgut sutures. Close triangles like a book, by bringing the original guiding sutures together. Suture first the vaginal side of the wound, comprising mucous membrane and fascia, from within outward, with a continuous suture. Having tightened the vaginal stitches and buried sutures, there now remains merely a straight line of fascia and skin, extending downward from the lowermost point of the vagina to the bottom of the tear, to be sutured in separate layers, with such material as the operator may select.

Ophthalmic Record, Chicago

September, XXIV, No. 9, pp. 439-490

105 Preventive and Curative Treatment of Pneumococcal Ulcer of Cornea. A. M. Ramsay, Glasgow.
106 Case with Foreign Body Located in Lens. F. W. Alter, Toledo.
107 Progress in Treatment of Cataract in India. H. Smith, Amritsar, India.
108 Report of Case of Mirror-Writing. F. P. Calhoun, Atlanta, Ga.
109 Errors of Refraction and Their Average Frequency. A. C. Durand, Ithaca, N. Y.
110 Unusually Happy Result Following Removal of Intra-Ocular Foreign Body which had been in Eye Nearly Four Months. C. R. Elwood, Menominee, Mich.

Providence Medical Journal

September, XVI, No. 5, pp. 237-292

111 Chronic Acid Gastritis, Gastric Erosions and Ulcerations. A. M. Burgess, Providence.
112 Prostate. J. E. Kerney, Providence.
113 Importance of Early Diagnosis in Gynecologic Surgery. W. L. Chapman, Providence.
114 Carelessness in Physical Examinations for Life Insurance. W. H. Peters, Providence.

Washington Medical Annals

September, XIV, No. 5, pp. 281-296

115 Case of Thrombosis of Coronary Artery. B. M. Randolph, Washington, D. C.

West Virginia Medical Journal, Wheeling

September, X, No. 3, pp. 73-108

116 Clinical Study of Uterine Hemorrhage. T. A. Ashby, Baltimore.
117 Glaucoma. J. L. Dickey, Wheeling.
118 Diagnostic and Therapeutic Value of Roentgen Ray. R. H. Pepper, Huntington.
119 Pulmonary Tuberculosis; Diagnosis and Treatment. E. F. Peters, Maybeury.
120 Evolution of Surgery. G. A. MacQueen, Charleston.
121 Plea for Justice to Patient. W. R. Hudson, Huntington.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

September, XII, No. 141, pp. 257-288

1 Education of Children with Defective Vision. To be continued. N. B. Harman.
2 Lymphocytomatosis or Lymphoblastomatosis, Especially of Kidneys. F. P. Weber.
3 *Congenital Heart Disease and Ulcerative Sore Throat. J. D. Rolleston.

3. Heart Disease and Ulcerative Sore Throat.—In the heart of a male infant, aged 11 months, who died from bronchopneumonia, the following anomalies were present: (1) Transposition of the great arterial stems, the aorta arising from the infundibulum of the right ventricle and the pulmonary artery from the left ventricle. The walls of the right ventricle were considerably hypertrophied, being almost as thick as those of the left. Both ventricles entered into the formation of the apex. (2) Marked deficiency of the interauricular septum, which was represented by a narrow band 1.5 cm. long by 0.5 cm. broad. The foramen primum lay anterior to it, and posteriorly there was a widely patent foramen ovale. (3) An interventricular foramen, 1.2 cm. in diameter in the "undefended space." (4) Stenosis and hypoplasia of the pulmonary artery, which had only two cusps. No gross changes were found in the other organs.

British Medical Journal, London

September 4, II, No. 2853, pp. 353-388

4 Educational Number.

Dublin Journal of Medical Science

September, III, No. 525, pp. 161-240

5 Acidity and Alkalinity as Applied to Physiology; Theory of Colored Indicators. W. G. Smith.
6 Creatin and Creatinin. B. A. McSwiney.

Glasgow Medical Journal

September, LXXXII', No. 3, pp. 161-239

7 Medical Conditions in Glasgow One Hundred Years Ago. A. J. Ballantyne.
8 Hematuria; Its Causes and Diagnosis. D. Newman.
9 Use of Pituitary Extract in Obstetric Cases. W. D. Macfarlane.

Indian Medical Gazette, Calcutta

August, L, No. 8, pp. 281-320

10 Results of Treatment of Sixty-Nine Cases of Cholera by Rogers' Method. J. A. Sinton.
11 Morphin Injector's Septicemia (Whitmore's Disease). H. H. G. Knapp.
12 Outbreak of Anthrax. McCombie.
13 Year's Surgery at Secunderabad Civil Hospital. C. H. Brodribb.
14 Surgical Notes from Madras Hospital. W. J. Niblock.
15 Florence's Reaction—Neglected Test for Seminal Stains. S. N. Goré.
16 Case of Raynaud's Symmetrical Gangrene. K. T. Vora.
17 Progressive Muscular Dystrophy. N. L. Mookerjee.
18 Pocket Electroscope. F. D. Bana.

Journal of Laryngology, Rhinology and Otology, London

September, XXX, No. 9, pp. 329-384

19 External Operation on Frontal Sinus. R. H. Skillern.
20 *Shoulder-Arm-Hand Syndrome of Paranasal Sinus Disease. J. C. G. Macnab.
21 Herpes Zoster Oticus Combined with Recurrent Laryngeal Paralysis. D. McKenzie.
22 *Acute Ulcerative Tonsillitis Associated with Virulent Pyorrhea Alveolaris. A. Ryland.

20. Shoulder-Arm-Hand Syndrome of Paranasal Sinus Disease.—Macnab reports three cases presenting the shoulder-arm-hand syndrome described by Bliss. They occurred in males between the ages of 20 and 40, and all complained of the shoulder-arm-hand pain. One was sent on account of tonsillar pain of two years' duration, the upper limb pain having lasted over three years. Two of the patients had also occipital pain. The nasal cavity showed in one case septal deviation to the affected side with a crowded middle turbinate, and a faint trace of mucopus in the olfactory cleft. In the other two cases there was enlargement with polypoid degeneration of the mucous lining of the middle turbinate, but in these cases little pus was detected anteriorly even after shrinkage with epinephrin. However, all had sufficient evidence for an exploration of the posterior ethmoids and sphenoids which showed that the main pathologic condition was enlarged cystic cells easily broken down and lined with unhealthy and diseased mucous membrane. Exenteration of the posterior cells as completely as possible was carried out, while the whole anterior wall of the sphenoid was removed. Within a comparatively short time all acknowledged that their symptoms were decidedly better. It is difficult to account for this referred pain, at least anatomically, but that it does occur is evident from the reported cases.

22. Ulcerative Tonsillitis Associated with Pyorrhea Alveolaris.—Ryland's patient complained of sore throat, of sudden onset and of five days' duration. There was excavation of tissue in three or four separate and distinct areas on the buccal surface of each tonsil. The ulcerated edges were clear cut, but irregular, and surrounded a greyish sloughing base. The neighboring inflammatory areola was only slightly marked. There was no edema, little pain, and the fauces, palate and uvula were free from inflammatory change. The tonsillar lymphatic glands on each side were slightly enlarged. The nose revealed an extreme anterior deviation of the cartilaginous septum to the right side, probably of traumatic origin. The patient was a mouth breather. Syphilis was denied. The Wassermann test was not carried out. Solution of silver nitrate, 20 per cent., was applied daily to the ulcerated areas, which under this treatment began to improve, and healed almost completely by the seventh day. On the sixth or seventh day of treatment, there suddenly appeared an acute, virulent and rapidly progressing septic invasion of the gums of both upper and lower jaws. The gums rapidly became soft, spongy, and tender. Pus was seen to be freely exuding from between them and the teeth. The temperature rose.

There was headache, malaise, the patient was toxemic, and the decision was almost made to remove freely the infected teeth. Pure phenol and other remedies were used locally without effect. Eventually under the influence of hydrogen peroxid the infection left the mouth almost as suddenly as it had appeared. The pyorrhea lasted for eight days. No mercury or other antisyphilitic remedies had been given. A bacteriologic examination of the alveolar exudate during the height of the infection revealed a pure growth of a long-chained Gram-positive streptococcus, of unusually large size as regards the cell bodies. With methylene blue, there was definite bipolar staining. No cultural examination was made from the original lesion, but it would appear highly probable that the same organism was responsible for both the tonsillar and alveolar infections. A point of interest is the extreme rapidity with which the organism surrendered to hydrogen peroxid.

Lancet, London

September 4, II, No. 4801, pp. 529-586

23 Leprosy. C. M. O'Brien.
24 Phantom Aneurysms. S. West.
25 Treatment of Gunshot Wounds of Femur by Modified Thomas' Splint. C. Wallace and B. C. Maybury.
26 *Case of Undulant Fever Treated by Autogenous Vaccine. S. A. Owen and H. B. Newham.
27 *Use of Quinin in Treatment of Experimental Gaseous Gangrene. K. Taylor.
28 *Agglutination Reactions of Blood of Soldiers Inoculated Against Typhoid. D. I. Dakeyne.
29 Brain Lipoid as Hemostatic. A. D. Hirschfelder.
30 Economy in Food During War. A. K. Chalmers.

26. Autogenous Vaccine in Undulant Fever.—In the case cited by Owen and Newham an autogenous vaccine was prepared and an initial dose of approximately 200,000,000 organisms was administered on December 4. No ill effects followed the administration of this dose, and on the sixth it was seen that the temperature had fallen to normal, and with the exception of a slight rise to 99 F. on the evening of that day and two subsequent rises to 99, it remained practically at the normal point until December 12. It then commenced to mount again in the typical manner of undulant fever until the fifteenth, when a second dose of the vaccine was given (200,000,000), and up to Jan. 4, 1915, the temperature, beyond a few slight rises to about 99.2 remained fairly normal, and the patient showed marked improvement in his general condition. A third dose of vaccine was administered on December 24, as the temperature was a little irregular.

The patient expressed himself as feeling well as a result of the injections. Sweating was absent; he increased in weight and had a general feeling that he was improving markedly. On January 4 a fourth dose of vaccine was given, but on the fifth the temperature suddenly rose, accompanied by rigor, to 105, and a typical attack of lobar pneumonia developed. (At this time there were three acute cases of pneumonia near him in the ward.) The temperature fell by lysis and remained somewhat irregular till January 26 when it finally came down to normal and remained so until the patient's discharge on April 7. In all only four doses of the vaccine were administered. In view of the known inefficacy of ordinary medicinal preparations to in any way alleviate the symptoms or control the progress of this disease it is satisfactory to record that in this case improvement was obtained by the use of an autogenous vaccine. Previous reports of treatment with stock vaccines have not been encouraging.

27. **Quinin in Experimental Gaseous Gangrene.**—The results of Taylor's observations may be briefly summarized as follows: *A.* Quinin has shown a marked bactericidal activity against the gas bacillus. 1. It has inhibited its growth in vitro, in which it was ten times as effective as phenol. 2. It has reduced the mortality from gaseous gangrene in animals from 100 to 41 per cent. *B.* Quinin has shown strong laboratory evidence of value as a general antiseptic. 1. Its general bactericidal power was higher than that of phenol. It was especially effective in a menstruum of pus. 2. It did not damage healthy tissue in local injections of effective concentrations. It is known to produce local anesthesia, frequently a desirable result. 3. It produced no symptoms of intoxication in the animals treated. It was used in hypertonic solution. 4. It showed a strong antitryptic action in vitro. On the evidence of these experiments a 1 per cent. solution of quinin hydrochlorid is now being tried by Taylor for the treatment of gaseous gangrene and other infections. A report on the result of its use will be published later.

28. **Agglutination Reactions of Blood of Soldiers.**—The preliminary inquiry made by Dakeyne of which this paper gives a summary, deals chiefly with the power which the blood of persons inoculated with dead typhoid bacilli has to agglutinate the *Bacillus typhosus* and some allied bacilli and is based on the examination of 280 soldiers who had received one or more injections of antityphoid "vaccines" within the previous twelve months. The tests were made according to the Delépine method, with dilutions of approximately 1:20 in current work, controlled, when thought desirable, by further tests with exactly measured 1:30 dilutions. The time limit was in all cases two hours. The serums were tested against a typical *Bacillus typhosus*, also against *Bacillus paratyphosus* B, and a *Bacillus enteritidis* (7,160) obtained recently from a typical case of food poisoning. The men examined were under treatment in the Manchester military hospitals for either wounds or illness.

Over 80 per cent. of cases gave a definite reaction, while 16.4 per cent. gave no reaction. Further, a man inoculated twice has a much greater chance of developing and retaining a reaction than one inoculated only once. There is a gradual diminution in the reaction as the result of the lapse of time. This is especially marked at the end of the eighth month. Only one case out of nineteen examined within a month of inoculation was found negative. This man had been inoculated once only and his serum, though giving no reaction with the *B. typhosus* used, gave a marked reaction with a strain of the *B. paratyphosus* B. There was no history of paratyphoid infection. If this case be excluded, all those examined within a month of inoculation gave a reaction. It appears that after the end of the first month the reaction is liable to disappear rapidly. Seven men were examined who had not been inoculated within a year. Three, who had been inoculated from twelve to eighteen months previously, were negative; three others, inoculated once each, fourteen, twenty-four and forty-five months previously, respectively, gave strong reactions. One man inoculated five years before, gave a slight reaction. This suggests to Dakeyne that individual peculiarity may have an effect deserving consideration.

Archives de Médecine des Enfants, Paris

August, XVIII, No. 8, pp. 405-460

31 *Spastic Rigidity in Infants. J. Comby.
32 *Effectual Action of Fuchsin in Treatment of Impetigo and Suppurative Skin Disease in General. C. Ferreira.
33 Lymphogranulomatosis in Boy of Five. (Maladie de Sternberg.) Blanc.
34 Tuberculosis of the Liver in Infant Under Four Months. H. Barbier.
35 Congenital Deformity in Lower Segment of Spinal Cord. (La myelodysplasie de Fuchs.) J. Comby.

31. **Spastic Rigidity in Children.**—Comby is convinced that Little's disease can be traced to syphilis in some cases, to birth trauma in others, or to acute encephalitis, primary or secondary to infectious disease. In other cases its origin is unknown. He compares here the clinical pictures in thirteen cases of the typical form of Little's disease, seven of spastic rigidity entailed by acute encephalitis, and eighteen of obstetric origin.

32. **Fuchsin in Treatment of Pyodermitis.**—Ferreira has been much impressed with the benefit from local application of fuchsin in a number of cases of impetigo, intertrigo and other rebellious skin affections in infants. The details of twelve cases are given.

He uses the ordinary bacteriologic fuchsin stain, Ziehl's carbol-fuchsin solution, which he prepares by dissolving 1 part fuchsin in 10 parts alcohol, with 5 parts phenol and 100 parts distilled water. He has used this in hundreds of cases and never noted any signs of absorption of phenol, the urine never showing any disturbance in color or composition. With this technic there is no need for a dressing. The fuchsin mixture is applied on cotton to the crusts, pressing it into each after all loose and friable parts of the crusts have been removed with sponges dipped in a 1:1,200 solution of zinc sulphate or its equivalent. The crusts absorb the fuchsin mixture and harden, forming an impermeable red varnish. It is applied anew each day and the crusts gradually grow smaller and smaller. The only drawback is the possible staining of the linen.

Presse Médicale, Paris

August 30, XXIII, No. 40, pp. 321-332

36 *Lesions of Trunk Nerves in War. V. (Les lésions des gros troncs nerveux des membres par projectiles de guerre. Les différents syndromes cliniques et les indications opératoires.) Dejerine and J. Mouzon.

36. **Wounds of Trunk Nerves.**—Professor Dejerine, Mme. Dejerine and J. Mouzon here present the fifth instalment of their extensive study of gunshot and shell wounds of trunk nerves in arms and legs, the syndromes resulting and the indications for operative treatment at the time or later. They are in charge of a hospital specializing in treatment of such cases. The wounded do not reach this hospital until about six weeks after the injury, and the writers say that until at least this interval has elapsed, the neurologic findings are not conclusive for or against operative measures. They discuss in this instalment what they call the dissociated syndromes, comparing the clinical with the operative findings in cases from their service and deducing the indications for operation. The general diagnosis is also discussed, the sources of error, the objective symptoms, modification of the reflexes and the changes in the tissues and in the response to electric stimuli, concluding with a discussion of the technic, showing the procedures to be commended and those to be shunned, with concrete instances. The article is illustrated. In certain cases the symptoms of compression soon after the injury subsided spontaneously in a few weeks, to a complete cure by the end of a few months. The trauma must have caused the compression and, when this ceased to act, repair started at once. This is very different from permanent compression or secondary compression, for both of which operative relief is indispensable. The Society Proceedings also contain a detailed summary, by the same writers, of their experiences with forty-two cases of wounds of the spinal cord. With an injury of this kind, they say, the best time for operative treatment is between the fifteenth and the thirtieth days if operative intervention is required. Before this, the shock and the lesions in the

vicinity blur the differential picture, and later than this bladder infection becomes troublesome and cicatricial changes impede restoration of function.

Berliner klinische Wochenschrift

August 16, LII, No. 33, pp. 865-884

37 Tetanus. (Klinische und therapeutische Erfahrungen über den Tetanus.) B. O. Pribram. To be continued.
38 Intravenous Treatment of Typhoid with Sensitized Bacilli Emulsion. F. Meyer.
39 *Appendicitis and Typhoid. G. Wolfsohn.
40 Operations on Soldiers from Standpoint of Regaining Military Efficiency. (Zur Frage des operativen Eingriffes bei Heeresangehörigen.) P. Weimann.

39. **Typhoid Localizing in the Appendix.**—Wolfsohn has had a number of men sent to the base hospital in his charge with the diagnosis of appendicitis. The men had not been taken sick suddenly, but for some days or weeks had felt depressed and ailing, sometimes with headache and pains in the limbs, and always with diarrhea and abdominal pains. The men had been taking castor oil or opium for the diarrhea but it returned after the medication, and blood had been noticed in the stools in some cases. The aspect is more that of health than usual with appendicitis, but the region of the cecum is tender although the abdominal wall over it is not rigid but quite soft. Bacteriologic examination of stool, urine and blood for typhoid bacilli is constantly negative. He removed the appendix in ten of twelve such cases and all the symptoms subsided at once, and in ten or twelve days the men were entirely well. The lesions in the appendix were never very pronounced, but in a number of the cases typhoid or paratyphoid bacilli were cultivated from the inner wall of the appendix although none could be found in the blood, urine or stools. In two cases the diagnosis was acute appendicitis and the appendix presented the usual lesions of this and contained typhoid and colon bacilli, streptococci and staphylococci. All the men had been systematically inoculated against typhoid, and Wolfsohn is convinced that this had rendered the tissues so resistant to typhoid infection that the typhoid bacilli could find no lodgment except in the appendix. It is possible that typhoid bacilli may lurk in the appendix, as we know they do sometimes in the gallbladder, without causing appreciable symptoms.

Deutsche medizinische Wochenschrift, Berlin

August 26, XLI, No. 35, pp. 1025-1056

41 *Deposits of Coal Dust in the Intestines. (Kohlenstaubablagerungen im Darm.) O. Lubarsch.
42 *Improved Technic for Bacteriologic Diagnosis of Cholera. H. Aronson.
43 *Diagnosis of Heart Disease by Usual Methods of Examination. (Die Diagnostik der Herzerkrankungen mittels der in der Praxis üblichen Methoden.) H. Rosin. Commenced in No. 34.
44 *Typhoid Paralysis. (Lähmungen nach Typhus.) J. Zadek.
45 Roentgen Diagnosis of Perforation of Intestines. H. Popper.
46 *Ovariotomy During Pregnancy. F. Unterberger, Jr.
47 *Iodin-Guaiacol-Glycerin Treatment of Erysipelas. E. Szecsy.
48 Tuberculosis at Shanghai. H. Dold.
49 Splint for Fracture of Humerus. (Innenschiene bei Oberarmbruch.) L. Engelhardt.
50 Treatment of Abdominal Wounds. (Zur Behandlung der Bauchschussverletzungen im Felde.) W. von Brunn.

41. **Deposits of Coal Dust in the Intestine.**—Lubarsch found macroscopic deposits of coal dust in the Peyer's patches of a man of 60. This pseudomelanosis might very readily have been mistaken for relics of blood accumulations, and it is in this way that such cases have been interpreted in the past. But Lubarsch presents evidence as to the true coal-dust nature of the deposits, especially their localization exclusively in the lower Peyer's patches of the ileum to 1.10 m. above the valve; their color, shape and chemical behavior, and the frequency of this finding when systematically sought for, regardless of inflammation, hemorrhages or other morbid processes. Since he has been examining for it systematically he has found it in 31.2 per cent. of 280 cadavers: in 6 from 2½ to 6 years of age; 6 from 10 to 20; 8 from 20 to 30; 14 from 30 to 40, and the others above this age. He also found similar deposits in the bowels of a guinea-pig. In a number of the cadavers there was but little tendency to anthracosis in the chest. For these and other reasons enumerated he thinks that there can be no doubt that the coal dust gets into the villi by being swallowed. The findings sustain the assumption that infection with tuberculosis occurs both by way of inhalation and the food.

42. **Improved Technic for Cultivating Cholera Germs.**—Aronson's method is based on the specific splitting of cane sugar added to an Endo plate, and the ability of cholera germs to proliferate in mediums too alkaline for colon bacilli. The technic is described in detail and the method styled the easiest and the most certain means at our command for detecting cholera germs, especially in carriers and in comparatively symptomless cholera.

43. **Diagnosis of Heart Disease.**—In concluding this long review of the diagnosis of heart disease by the general practitioner, Rosin says that the old and tried methods of examining for heart disease have lost none of their importance in comparison with the newer methods. But a thorough examination now should include certain of the newer methods, especially measurement of the blood pressure, palpatory percussion, Roentgen examination and the Wassermann test. Electrocardiography is also useful, affording information not obtainable in any other way. But the findings have not been interpreted to date with sufficient accuracy to justify recommending to the general practitioner the purchase of the extremely expensive apparatus required for it.

44. **Post-Typhoid Paralysis.**—Zadek reports the case of a boy of 9 convalescing from typhoid who developed right hemiplegia with loss of reflexes. It was evidently of cerebral origin, the work of the typhoid, and it rapidly improved under electric treatment, massage and baths and by the end of the month had retrogressed almost entirely.

46. **Ovariotomy During Pregnancy.**—Unterberger reports the details of eight cases in which ovariotomy was done on pregnant women. In one of the women it was bilateral, and abortion followed in this case, but the pregnancy was not interfered with in the other cases. He advises to postpone the ovariotomy until the third or fourth month if possible, as there is less danger of interrupting the pregnancy after this.

47. **Treatment of Erysipelas.**—Szecsy has been much pleased with the efficient action of a mixture of 10 parts each of guaiacol and tincture of iodin in 80 parts glycerin, applied as a lininent to the erysipelatous region. It has merely a symptomatic action, but in this it far surpasses all other measures of which he knows.

Medizinische Klinik, Berlin

August 15, XI, No. 33, pp. 905-932

51 *Urology and War. (Urologische Erkrankungen im Kriege.) R. Oppenheimer.
52 Hernias from Industrial and Other Accidents. E. Schepelmann.
53 *Autoserotherapy of Gangrenous Venereal Ulcer, etc. (Behandlung des Ulcus molle gangraenosum und anderer Ansteckungskrankheiten mit Eigenstoff, Eigenserum oder Eigenblut.) W. Treupel.
54 Mixed Infection with Typhoid. H. Koenigsfeld.
55 *Diabetes Insipidus After Injury of Skull. F. Kleeblatt.
56 The Blood Picture in Smallpox. (Zum Blutbilde der Pocken.) J. Falk.
57 Side Suture of Subclavian Artery. (Seitliche Naht des Durchschusses der Arteria subclavia.) H. Hans.
58 First Aid for Fractured Bones. (Erste Versorgung bei Knochenbrüchen.) H. Spitzy and A. Hartwich.

51. **Urology on the Firing Line.**—Oppenheimer remarks that there has been no great war since the modern methods of urologic investigations have been introduced, and he has utilized the present war to collect data in this line. The summaries of sixteen cases are given to illustrate the various types encountered, both of wounds and of urologic affections such as are observed at any time but for which the stress of the campaign induces a predisposition and creates exciting causes. He says in conclusion that in calculating the indemnity, he estimates that the loss of one kidney reduces the earning capacity on an average about 45 per cent.; a traumatic detrusor paralysis, from 50 to 80 per cent.—on account of the danger of secondary pyelonephritis—and permanent incontinence, from 70 to 80 per cent.

53. **Autoserotherapy for Gangrenous Venereal Ulcer.**—Treupel relates that in two progressive cases of this kind, long uninfluenced by vigorous local measures, injection of the patient's own serum seemed to arrest the gangrenous

process, and start the patient on the road to recovery. In the first case the gangrenous ulcer scabbed over and the scab was thrown off the fifth day. Three injections of the patient's own active serum were given, in the course of four days, the amounts ranging from 10 to 24 c.c. In the second case four times these doses of serum or 100 c.c. of the blood were given and prompt benefit was apparent, the gangrene promptly healing. Febrile skin affections were likewise favorably influenced. In one case of petroleum eczema, with temperature of 40.4 C. (nearly 105 F.), the fever rapidly dropped and the skin affection retrogressed after a venesection of 50 c.c. of blood and intravenous injection of 200 c.c. of the patient's own blood. The cure was completed by two further injections in four days. The work issues from the university clinic for skin diseases at Jena, in charge of Spiethoff. He has found this "own blood" or "own serum" beneficial also in treatment of catarrhal febrile sore throat and prostatitis, typhoid and tetanus.

55. **Diabetes Insipidus After Trauma of the Skull.**—Kleeblatt relates that a robust young mechanic was rendered unconscious for ten minutes when a wheel from a pulley fell on his head from a height of over 9 feet. The base of the skull was fractured, and the third day afterward symptoms of central severe diabetes insipidus appeared and have persisted since. Roentgenoscopy reveals nothing abnormal; the hypophysis region in particular seems intact. The specific gravity of the urine showed no rise even under long abstention from water and ingestion of salt. Hypophysis preparations induced a transient increase in the total concentration power, but the general health did not benefit by this. The blood findings are within normal range. During periods of abstention from drinking water, the output of urine materially surpassed the intake. The blood became much more concentrated also.

Münchener medizinische Wochenschrift, Munich

August 24, LXII, No. 34, pp. 1141-1172

59 *Disturbances in the Circulation from Effect of Shock Toxins. (Durch "Schockgifte" erzeugte Zirkulationsstörungen.) H. Mautner and E. P. Pick.
60 *Technic for Rendering Agar Fit to Use More than Once in Bacteriologic Research. (Regenerierung des verbrauchten Endoagars.) H. Mohorcic.
61 *Acute Yellow Atrophy of the Liver in Syphilis. Bendig.
62 Technic for Cooling Roentgen Tubes. (Die Kühlung der Röntgentherapieröhren mit siedendem Wasser.) Bucky.
63 Blood from Slaughter-House as Food Product. (Verwendung von Schlachtblut zur menschlichen Ernährung.) F. Hofmeister. Commenced in No. 33.
64 Emergency Sterilization of Drinking Water. (Zur Entkeimung von Trinkwasser im Felde.) W. Kruse. (Einfaches, kolloidchemisches Verfahren zur Entkeimung von Oberflächenwasser mit Beziehung auf die Trinkwasserversorgung im Felde.) M. Strell.
65 Blood Charcoal in Treatment of Typhoid and Paratyphoid. (Ueber Tierblutkohle.) P. Como.
66 Recurring and "Resting" Infection After Gunshot and Shell Wounds. (Zur Frage der rezidivierenden und "ruhenden" Infektion bei Kriegsverletzungen.) Most.
67 Abdominal Wounds. (Behandlung der Bauchschussverletzungen im Felde.) A. W. Meyer.
68 Psychiatry on the Firing Line. (Kriegspsychiatrische Erfahrungen aus der Front.) E. Wittermann.
69 Artificial Limbs and Aids. (Zur Frage der Armprothesen.) H. Spitzy. (Vorschlag zur Herstellung eines künstlichen Armes.) P. Bade. (Stützverbände im Felde.) F. Hübler.
70 Microphotography. (Praktische Winke für Mikrophotographie.) Stange.

59. **Cardiovascular Disturbances from Shock Toxins.**—Mautner and Pick report research on dogs, cats and rabbits, studying the drop in blood pressure after intravenous administration of some albumin cleavage product. The shock action seems to be in the nature of a spasm of the nonstriated muscle in general and particularly of the musculature of the vessels of the intestines, liver and lungs. Drugs which dilate the vessels, such as amyl nitrite, arrest the spasmodic contraction and thus check the shock action. This explains the favorable influence of caffein in conditions resembling shock, as after antityphoid inoculation in exceptional cases. Its vasodilating action counteracts the spasm from the shock toxins.

60. **Regeneration of Agar.**—Mohorcic says that in the course of the eleven months of war the supply of agar-agar has been mostly used up, and hence he has been evolving a technic to render it possible to use agar-agar over and over again in bacteriologic research.

61. **Acute Yellow Atrophy of the Liver in Syphilis.**—Bendig's patient was a robust young woman nine months pregnant. She was given mixed mercury and salvarsan treatment on account of a primary syphilitic lesion. The first two injections of salvarsan caused no disturbance but she vomited after the third, and two days later symptoms of acute yellow atrophy developed, fatal within two days. He reported in 1908 an almost identical fatal case in a young woman but this was long before salvarsan was invented so that the salvarsan need not be incriminated in the present case.

Therapeutische Monatshefte, Berlin

August, XXIX, No. 8, pp. 421-476

71 *Recent Progress in Treatment of Liver, Gallbladder and Pancreas Disease. (Fortschritte in der Behandlung der Leber-, Gallen- und Pankreaskrankheiten.) Hochhaus.
72 *Treatment of Gynecologic Hemorrhage. G. A. Wagner.
73 *Cholera Infantum and Other Severe Diarrheas in Infants. (Behandlung des Brechdurchfalls und der ruhrartigen Erkrankungen im Säuglingsalter.) L. Langstein.
74 *Roentgen Rays in Treatment of Acne. Dössekker.
75 Aims and Methods of Psychotherapy. J. H. Schultz.
76 Operative Treatment of Wounds of the Skull in War. (Operierte Schädelschüsse.) Kalkhof.
77 *Trademark Names and Substitutes. ("Ersatz"-Waren und Warenzeichengesetz.) W. Heubner.

71. **Present Status of Disease of the Bile Apparatus and Pancreas.**—Hochhaus regards cirrhosis of the liver as the result of a number of interacting causes which explains why it is so refractory to treatment. Referring to the bile secretion, he calls attention to recent study of the secretion of bile in a man with a fistula into the liver (Ignatowsky). Animal albumin stimulated the production of bile much more than vegetable albumin, and fat even still more. Mineral waters, on the other hand, checked the secretion of bile. These findings confirm empiric experiences. Reach reported last year that morphin, epinephrin, pilocarpin and atropin increased the tonus of the sphincter at the papilla of Vater and thus retarded the outflow of bile, while papaverin relaxed this sphincter. Hence the latter might relieve in jaundice in which spasm of this sphincter is a factor. In the diagnosis of pancreas disease, an excess of creatin or fat in the stools is easier to determine and more decisive than the ferment content. Hustin's recent research has confirmed the statements as to the stimulating action of pilocarpin on the pancreas. He found (experimentally) that this action was not direct but occurs only when part of the intestine is functionally capable. When this is the case, pilocarpin intravenously stimulates pancreatic secretion. Sodium bicarbonate seems to have the opposite effect, depressing pancreas secretion. Wilbrand concludes from his study of this subject that sodium bicarbonate can be relied on to check the external secretion of the pancreas while the internal is probably stimulated by it.

72. **Gynecologic Hemorrhage.**—Wagner remarks that the introduction of organotherapy and of radiotherapy have contributed to do away with hysterectomy for genital hemorrhage. We have learned that what used to be called hypertrophic and hyperplastic endometritis is in reality not endometritis at all, but a physiologic change in the uterus lining which occurs periodically under the influence of the functioning of the ovaries. We have learned further that true endometritis does not induce hemorrhage.

The physiologic menstrual hemorrhage is influenced by the behavior of the blood vessels, their innervation and the composition of their walls; by the composition and condition of the uterine musculature, and also by the condition of the blood with respect to its coagulating power. Any one of these three factors may become deranged, so that even with normal ovarian functioning there may be pathologic hemorrhage. The hemorrhage may thus be of mechanical origin or of ovarian origin, and classification of the cases points the way to effectual treatment. The mechanical group includes the cases of hemorrhage from polyps, erosions and myomas located beneath the mucosa which stretch and tear the vessels

above them. Another group includes the cases of abnormal hyperemia of the uterus, from psychic, thermic or sexual causes, or from high blood pressure, tight lacing or constipation. Other groups of mechanical hemorrhage include the cases of defective contraction of the uterus from muscular insufficiency; arteriosclerosis or syphilitic changes in the vessel walls; deficient coagulating power; constitutional disease; and, finally, the peculiarly persisting tendency of hemorrhage with extra-uterine pregnancy.

In contrast to all these so-called mechanical groups, are the hemorrhages for which ovarian functioning can be incriminated. The typical forms of this occur in puberty and at the menopause. When the ovaries are dying off, they are like a lamp that is going out but flickers up now and then. The Abderhalden test confirms the dysfunctioning of the ovaries in these cases, as also in hemorrhage with chlorosis and obesity, but above all with myomas and affections of the adnexa. In certain cases the hemorrhage may be traced to abnormal functioning of some other of the glands with an internal secretion, closely connected with the ovaries. Sehrt has differentiated a group in which the hemorrhage is the result of thyroid insufficiency; the blood in these cases coagulates abnormally fast. The list of these groups closes with those in which there is actual hyperplasia of the uterine mucosa for which the ovaries are directly responsible, and the cases of necrotic processes from incomplete menstruation.

Classifying the case as mechanical or of ovarian origin, and in one of the above subgroups, points the way to causal and effectual treatment. The mechanical require local measures, and the first step is to exclude cancer. Unless this can be done with certainty, no attempts at conservative measures are justified. Here the curet is almost indispensable. The old idea that curetting would put an end to the tendency to hemorrhage, as a new mucosa grows out, has been proved erroneous—the new mucosa is under the influence of the ovaries as much as the old. Permanent benefit was realized in less than 10 per cent. of 600 curetted cases on record. Cauterization is equally futile, as a rule, but tamponing the uterus is still, as ever, a reliable symptomatic measure to arrest bleeding. Removal of the cause may require cold sitz baths, digitalis if there is cardiovascular derangement, or calcium lactate by the mouth to tranquillize the over-excitable nervous system which is keeping up the active hyperemia in the genital organs. When the uterus is unduly flabby, ergot may help. Something of the kind given a few days before the period may ward off the tendency to excessive hemorrhage; electricity may also prove useful.

Organotherapy or radiotherapy or both are now at our disposal for the cases of ovarian origin, and give most gratifying results. They have aided in classifying cases, as when a case proves refractory to radiotherapy, for instance, this proves that some other factor is at work, unsuspected syphilitic changes or a submucosa site of a myoma, permitting, then, proper treatment. The effect of radiotherapy is prompter and more certain the nearer to the extinguishing of ovarian function. The great drawback is the danger of overlooking cancer. A number of such mishaps have been reported. Wagner applies radiotherapy by the close, filtered, cross-fire technic. Loose has reported excellent results in juvenile menorrhagia from small doses (2 or 3 X per ovary) with medium hard tubes, applied during the hemorrhage. After three or four exposures the hemorrhages are kept within normal range. The pathologic elements in the ovary seem to be corrected by this mild radiation while the normal elements do not feel its influence.

73. **Cholera Infantum.**—Langstein insists that with albumin milk correctly given complete recovery may almost be guaranteed. The infant with diarrhea and vomiting is given nothing but tea for from twelve to twenty-four hours, no longer, and then the albumin milk is commenced, not over 5 gm. ten times a day, with 3 per cent. of a maltose-dextrin mixture. The amount of albumin milk is increased by 50 gm. each day until the daily ration totals 300 gm. After the weight has become stationary, carbohydrates can be added up to 5 per cent. of the maltose-dextrin mixture. With a child over 3 months old, 1 or 2 per cent. flour or oatmeal can be added. He warns against giving too small a daily ration; especially serious is an undue restriction of carbohydrates. This is particularly dangerous for infants who have reached the stage of "decomposition." The nature of the albumin milk enhances the tolerance for carbohydrates. The lack of adequate carbohydrate in the food soon becomes manifest in the decline in the weight; it drops abruptly and the child collapses. The lack of carbohydrates is the more dangerous the more atrophic the child, the less reserves of carbohydrates it has to draw on. Even if the diarrhea keeps up, the ration must be increased as above described or there is grave danger of inanition.

One must be firmly convinced of the wisdom of keeping on with the albumin milk in this way, realizing that even frequent passages on albumin milk do not aggravate the condition, and that the bowel functioning will return to normal sooner or later. When the diarrhea and loss in weight have ceased, then we are less liable to disagreeable surprises and mishaps than with any other form of artificial feeding. Even if the diarrhea returns, hold steadfast to the albumin milk and the 3 per cent. carbohydrate. Any repetition of the starvation diet or withdrawal of carbohydrates may bring severe disturbances and collapse to the sick infant. A return to the starvation diet within a week may prove promptly fatal. Langstein discusses further the mishaps liable from infection or from return of the alimentary disturbance.

Albumin milk is not so uniformly effectual in dysenteriform diarrhea as in cholera infantum. Whey seems to act better, diluted half and half with oatmeal gruel. After the starvation period he gives 50 gm. of the whey and increases by 50 gm. daily with equal amounts of oatmeal gruel. As improvement sets in, 3 per cent. of a dextrin-maltose preparation can be added. He advises to make the whey artificially from the milk. Kaolin and charcoal have been given to infants as well as to adults, but no decisive judgment as to benefit from them can be drawn as yet. Their depressing action on the digestive ferments must be taken into account. The whey permits the diseased large intestine to recuperate while it supplies the salts needed by the organism. The prognosis on whey is not unfavorable, provided there is no complicating digestive nutritional disturbance. When the child has both cholera infantum and enteritis, he advises combating the former first and foremost by keeping the child on albumin milk.

74. **Roentgen Treatment of Acne.**—Dösseker says that experience is demonstrating that repeated small doses of the rays, not strong enough to induce appreciable reaction in the skin, or a single large dose with a reaction, seem to be able to modify the epidermis, that is, the sebaceous glands to such an extent that the tendency to acne dies out. His communication is based on large numbers of cases but he does not cite statistics nor bibliographic references, his aim being merely to recall attention to Roentgen treatment of acne, with his personal endorsement of it. Fortunately he adds, its efficacy is greater in acne spread over a larger surface, with numerous pustules, than in the less disfiguring, torpid type.

77. **Trademarks and Protected Names.**—Heubner reiterates that "protected" names of drugs sooner or later become the generally accepted term for the drug in question, the general term in common commercial and medical use. Legal authorities differ as to when this transformation takes place, but the fact that it does occur sooner or later is now generally accepted. Another instance of it, he relates, is seen in the labels of the drugs now supplied to the German army hospitals. Instead of the official name, hexamethylenamin, for example, the drug is labeled "Substitute for urotropin," *Ersatz für Urotropin, Ersatz für Aspirin,* etc. Tablets are supplied stamped in the same way, "Ersatz für Antipyrin, 0.5." The wrapper bears the full title, "Hexamethylentetramin, 0.5—Ersatz für Urotropin," with the place, "Garnison-Lazarett Magdeburg."

A medical officer at the front, without books, without a pharmacist, obliged to decide in a hurry, knows what action he can expect from "urotropin" for instance, while the

official name, indicating its chemical composition, has no concrete association in his mind with the clinical condition for which he wants the special action of the drug. Heubner adds that this has all been said a hundred times and just as often vehemently denied by the interested parties, but the fact remains that trade-marked names become in time the common name of the articles.

Wiener klinische Wochenschrift, Vienna

July 8, XXVIII, No. 27, pp. 725-752

78 *Occupational Changes in the Teeth. (Berufsmerkmale an den Zähnen.) M. Kraus.
79 Nonsensitized Vaccine in Treatment of Typhoid. E. Csernel and A. Marton.
80 Cholera Germ Carriers. (Cholerabazillenträger und ihre epidemiologische Bedeutung.) Stein.

July 15, No. 28, pp. 753-780

81 Cosmetic Considerations in Surgical Work. J. Sternberg.
82 Vaccine Therapy of Typhoid. R. Löwy, F. Lucksch, E. Wilhelm and E. Paulicek.
83 Pathology of the Nervous System in War. (Kriegsverletzungen und -erkrankungen des Nervensystems.) J. Donath. Commenced in No. 22.

July 22, No. 29, pp. 781-804

84 An Expert in the Use of Artificial Hands and Feet after Loss of Both Hands and Both Feet. R. Hofstätter.
85 Treatment of Erysipelas. O. Kren.
86 Congenital Hernia of the Diaphragm. (Zwerchfellbrüche.) R. Monti.
87 Garlic in Treatment of Catarrhal Enteritis. (Allium sativum als Therapeutikum bei infectiösem Darmkatarrh.) E. Marcovici.

July 29, No. 30, pp. 805-828

88 Modern Electromedicine in War Hospitals. J. Zanietowski. Concluded in No. 31.
89 Functional Heart Disturbances. T. Szasz.
90 Charcoal in Sterilization of Drinking Water. R. Kraus and B. Barbara.
91 Vaccine Therapy of Typhoid. F. Deutsch.
92 Pathology and Treatment of War Hematothorax. J. Tornai.
93 Erythromelalgia with Spontaneous Gangrene in Young Man. G. Bikeles and K. Radonicic.

78. **Occupational Deformity of the Teeth.**—Kraus gives illustrations of a number of typical changes in the teeth induced by factors connected with the occupation. Candy-maker's caries is one. The sugar dust in the air settles on the teeth and the acids generated from the sugar eat away the enamel below. There is thus a shallow pocket hollowed out in the upper part of the front of each front tooth. Workers with hydrochloric acid display a characteristic irregular necrosis of the teeth, after a stage of brownish spots on the teeth. It is a molecular necrosis, beginning at the cutting edge and working downward. The teeth thus are soon gnawed away by the process. Workers on metal may develop a dirty green coating on their teeth which long persists if the teeth are not well cared for. Shoemakers may wear away a groove in the edge of the front teeth where they hold the peg or nail. The pronounced arch in the upper front teeth of glassblowers is readily explained by the tube they use, and the small groove in the front teeth of tailors and seamstresses by their habit of biting off the thread. The illustrations given confirm Kraus' statement that the changes in the teeth described are typical enough to indicate the occupation.

Zeitschrift für Tuberkulose, Leipzig

August, XXIV, No. 4, pp. 241-320. Last indexed Sept. 11, p. 986

94 *Factors which Cooperate in Inducing Tuberculous Apical Lesions. IV. (Betrachtungen über die Entstehung der tuberculösen Lungenspitzenphthise.) C. Hart.
95 Improved Technic for Isolating and Cultivating the Tubercle Bacillus. S. A. Petroff (Saranac Lake).
96 The Newer Medicinal Preparations and Foods Advocated in 1914 in Treatment of Tuberculosis. G. Schröder.
97 Tuberculosis in India. E. Wilkinson.

94. **How Apical Processes Originate.**—Hart presents an array of arguments to sustain his views regarding the mechanical predisposition to apical disease from stenosis of the superior aperture, to which Freund called attention long ago. Hart has encountered a number of young cadavers with marked anthracosis in the apex but no signs of tuberculosis. There was always something abnormal in the aperture, however, preventing free ventilation of the apex beneath; dust accumulates here although the tubercle bacillus has not happened to find a lodgment here. He has also encountered in a few cadavers an actual groove in the lung below the apex, a subapical pressure groove, but this is rare. He restricts the term phthisical thorax to the form with stenosis and deformity of the aperture. This is distinct from the thorax of general asthenia and also from the acquired paralytic thorax in the emaciated and cachectic.

The primary defective development of the aperture may be merely one localization of a more or less general physical inferiority. The manifestation at the aperture of this physical inferiority is liable to invite tuberculous disease of the apex; when manifested elsewhere it is liable to induce a predisposition to other affections, gastric ulcer, for example. Hence he thinks it is too sweeping to call this type of chest the phthisical thorax, as the individual with this form of chest does not inevitably develop tuberculosis. It would be more correct to call it the asthenic thorax or some similar term which would express that it is a primary manifestation of a constitutional tendency.

Zentralblatt für Gynäkologie, Leipzig

August 28, XXXIX, No. 35, pp. 611-626

98 *Exclusive Radiotherapy of Uterine Cancer. (Dürfen wir operable Uteruskarzinome ausschliesslich bestrahlen?) S. Flatau.
99 *Treatment of Inveterate Prolapse of the Uterus. O. Walbaum.

98. **Exclusive Radiotherapy of Uterine Cancer.**—Flatau has not operated on cancer of the uterine cervix since 1913. The proportionate number of women still living and cured under radiotherapy alone is larger than he could ever report before with abdominal operations for cancer of the cervix. It is now beyond question that an incipient cancer focus can be destroyed by radium without leaving a trace. But certain experiences have suggested the possibility that although the primary focus may thus vanish without leaving a trace, there is a possibility that metastases may develop at remote points, far beyond the scope of the rays. Time alone can tell whether radiotherapy will oust surgery from the arena of treatment. The surgeon and the radiotherapeutist can go on working, each in his sphere; in time comparison of the results will show which is superior.

99. **Treatment of Inveterate Prolapse of the Uterus.**—Walbaum makes a septum in the vagina as a support leaving two narrow channels each side which permit natural drainage of the uterus. The septum is made by joining the exposed bladder to the exposed rectum, the exposed area in each drawn up with circular stitches to provide a better hold. The perineum is also reenforced and sutured close up to the mouth of the urethra. He has applied this technic with most gratifying results in cases of extreme prolapse, primary or recurring.

Policlinico, Rome

August 29, XXII, No. 35, pp. 1161-1196

100 Abstention from Drainage of Septic Wounds in War. (Cura delle ferite di guerra settiche senza drenaggio.) L. Isnardi.
101 Inguinal Adenitis from Physical Overexertion. (Adenite inguinale da sforzo.) R. Sacco.

Riforma Medica, Naples

August 28, XXX, No. 35, pp. 953-980

102 Study of the Virulence of Pneumococci in the Sputum of Pneumonia Patients, and Its Bearing on Isolation. C. Ninni.
103 Pathogenesis of Nephritis in Infectious Disease; Toxic Influences Main Factor. P. Montuschi.

Russkiy Vrach, Petrograd

XIV, No. 25, pp. 529-552

104 Chloroform of Russian Manufacture. P. I. Tikhoff and L. M. Sicheva.
105 Pathogenesis of Werlhof's Disease. M. M. Schugurova.
106 *Functional Relations between Organs; Changes in the Thyroid after Removal of the Suprarenals. E. E. Malovichko.
107 *Abdominal Fremitus. D. S. Schchetkin.

No. 24, pp. 553-576

108 *Cultivation of Leukocytes Outside the Body. P. P. Avroroff and A. D. Timofejevsky.
109 The Physician in Relation to the School. B. I. Vorotinsky.
110 Cranioscopy for Locating Foreign Bodies (Bullets) in the Head. A. T. Berdiaeff. Commenced in No. 21.
111 Non-Surgical Treatment in Military Surgery. G. I. Higier.

No. 25, pp. 577-600

112 Observations During Aviation. I. S. Tsitovich.
113 *Treatment of Russian Trypanosomiasis. V. L. Yakimoff and V. I. Vassilevskaya.
114 *Cases of Loss of Vision from Eau de Cologne, Denatured Alcohol and Similar Substitutes for Whisky. A. A. Yakovleva.
115 *Periodical Vomiting. A. I. Nikulin.
116 *Grafts of Umbilical Cord to Cover Defects in Buccal Mucosa. V. A. Perimoff.

106. **Functional Relations Between Thyroid and Suprarenals.**—Malovichko studied the changes in the suprarenals after removal of the thyroid, and vice versa. Of fifty dogs operated on for these studies eight succumbed; the rest were killed and the examination was done immediately afterward. It was found that after removal of the suprarenals, destructive lesions could be demonstrated in the thyroid in the form of degenerated epithelium, and changes in the colloidal substance and interstitial tissue. Removal of the thyroid together with the parathyroids does not seem to affect materially the suprarenals, but some fine structural changes in the cells could be demonstrated in them.

107. **Abdominal Fremitus.**—Schchetkin found abdominal fremitus in the right iliac region in patients suffering from chronic peritonitis with adhesions. This may be diagnosed clinically from the presence of this fremitus. The patient is asked to answer some questions and, while he is talking, the examiner's hand applied to the right iliac region experiences a manifest thrill or fremitus. He did not find this fremitus in acute peritonitis, or in any other abdominal affection, such as dropsy, but only in chronic peritonitis accompanied by solid connective tissue adhesions which transmit the fremitus of the diaphragm to the right iliac region.

108. **Cultivation of Leukocytes Outside of the Body.**—Avroroff and Timofejevsky succeeded in cultivating white blood corpuscles outside the body according to Carrel's method. The mononuclears of normal blood they found are able in the mediums to proliferate through karyokinesis, and to become transformed into different shapes, such as hypertrophied, giant and protoplasmic cells. This ability of the mononuclears to undergo such changes confirms the theory of their active rôle in the healing and regeneration of tissues with transformation into different forms such as polyblasts and giant cells. Cultivation experiments may thus shed further light on the question of the origin of the eosinophil granules. This article is illustrated.

113. **Treatment of Trypanosomiasis.**—Of various remedies used by Yakimoff for treatment of mice injected with trypanosomes from camels and donkeys in the Turkestan region, he found salvarsan and antimony trioxid most effective.

114. **Poisoning from Substitutes for Liquor.**—Yakovleva had the opportunity of examining eighty patients poisoned with cologne water, denatured alcohol, furniture polish, varnish or similar substitutes the patients had been using in the place of ordinary liquor. The general symptoms of denatured alcohol poisoning are depression instead of excitation of the nervous system, pain in stomach and chest, and vomiting. In addition there was amblyopia which usually set in rapidly in a few days or weeks, with great impairment of visual acuity, frequent appearance of absolute central scotoma and concentric narrowing of the field of vision. Poisoning from wood alcohol and eau de Cologne gave the same symptoms as described in the literature from methyl alcohol poisoning. Here frequently occurs a secondary aggravation of the impairment of vision, following a temporary improvement. Another peculiarity of methyl alcohol poisoning is its cumulative action—the symptoms of poisoning developed only after repeating the dose, usually the next day. The details of the eighty cases are tabulated in full, filling three large pages.

115. **Periodical Vomiting.**—Nikulin calls vomiting periodical when it occurs at the end of the so-called periodical activity of the gastro-intestinal tract. This activity, in the form of contractions of the stomach and intestines, secretion of pancreatic juice, bile, etc., is periodically followed by stages of rest during which no secretion and no peristalsis take place. Nikulin studied the occurrence of periodical vomiting in a dog, the vomiting recurring nine times. He reports that the vomiting usually started at the end of the "period of activity or work of the stomach, and it never occurred during the period of rest." During the vomiting the quantity of intestinal secretions—which contain intestinal and pancreatic juices and bile—is increased, twice or three fold, proportional to the motor power. It is evident that the motor and secretory properties are intimately connected, the increase of one causing the increase of the other. The total amount of ferments in the gastro-intestinal contents is increased during vomiting, proportional to the amount of the intestinal mixture. Periodical vomiting has been observed in pregnancy. It displays here some of the features he found in his experiments on the dog. The Abderhalden reaction was found positive with the serum during the period of work, and negative during that of rest, indicating an increased flow of ferments into the blood. When this increase is too great, the body tries to get rid of the superfluous amount of ferments through vomiting, which is thus periodical in character.

116. **Umbilical Cord as Patching Material.**—Perimoff describes two cases in which umbilical cord was used to cover the defects in mucous membranes (scar between upper and lower jaws, and fistula under the lingual bone). The results were excellent. His previous experiments along the same line were summarized in these columns, August 14, p. 658.

Hospitalstidende, Copenhagen

August 25, LVIII, No. 34, pp. 849-876

117 Antiseptic Action of Gastric Juice Dependent on Hydrochloric Acid Content. (Mavesaftens antiseptiske Virkning.) J. P. Gregersen.

Ugeskrift for Læger, Copenhagen

August 26, LXXVII, No. 34, pp. 1369-1394

118 *Roentgen Treatment of Cancer. (Om Røntgenbehandling af ondartede Svulster.) S. and J. Nordentoft.

118. **Roentgen Treatment of Malignant Tumors.**—Nordentoft reports the further course in twenty-four cases of cancer in which courses of Roentgen treatment were applied one or more years ago. He emphasizes that a person who has had a cancer removed, or cured by other means, must keep in touch with his physician afterward, realizing that he must be kept under sharp observation for all the rest of his life. Nordentoft makes a point of continued supervision, and publishes from year to year the present status of the more interesting cases, omitting superficial cancers and recurring mammary cancers. In this communication he presents evidence that cancer of the mouth and tongue may yield surprisingly quickly to Roentgen treatment, also that metastases of malignant disease are liable to retrogress under the Roentgen rays.

The series reported here include only the cases in which Roentgen treatment has conquered new fields, namely cancer starting in the mucosa of the mouth or vulva, or deep-seated cancer, as in the pelvis, abdomen, chest or brain, or cancer of the esophagus or rectum. Even in the absolutely hopeless cases, marked benefit was apparent for a time. This was particularly striking in a case with metastasis in the lungs from cancer elsewhere. Among the patients still in good clinical health are one man of 45 with a sarcoma in the mediastinum (the last course of Roentgen treatment was given in 1911); one woman of 64 with recurring cancer of the vulva (last treatment 1913), and several with cancer of the mouth. He also gives the details of cases which proved absolutely refractory to the rays, including one of cancer of the lung. The necropsy findings are also given in the cases that have terminated fatally after the Roentgen treatment or the patients have succumbed to intercurrent disease. The cases are listed serially for this report. The following yearly communications will carry on the history of each surviving patient under the same serial number. In time the data thus accumulated for each individual case, as the years go on, will supply a basis, by comparison, for general conclusions as to the efficacy and technic of roentgenotherapy in malignant disease. He urges others to carry on similar series, reiterating that a patient cured of cancer should never be allowed to forget the need for perpetual medical supervision to detect recurrence or metastasis in its incipiency.